Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

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THE
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☞See advertisement on last page

Poetry.

THE MIDNIGHT WIND.

BY WM. MOTHERWELL.

Mournfully! O, mournfully
The midnight wind doth sigh,
Like some sweet plaintive melody
Of ages long gone by:
It speaks a tale of other years—
Of hopes that bloomed to die—
Of sunny smiles that set in tears
And loves that mouldering lie!

Mournfully! O, mournfully
This midnight wind doth moan;
It stirs some chord of memory
In each dull heavy tone;
The voices of the much loved dead
Seem floating thereupon—
All, all my fond heart cherished
Ere death hath made it lone.

Mournfully! O, mournfully
This midnight wind doth swell,
With its quaint pensive minstrelsy,
Hope's passionate farewell
To the dreamy joys of early years,
Ere yet grief's canker fell
On the heart's bloom—ay! well may tears
Start at the parting knell!

THE STAR OF LOVE.

Now darkness veils the gilded skies,
And shrouds a slumb'ring world;
And night looks down with thousand eyes,
Her banner wide unfurl'd.

Still as the silent halls of death,
Tired nature takes her rest,
Hush'd is each lingering zephyr's breath
That fann'd her peaceful breast.

Amid the radiant orbs that deck
And concave as they roll,
Not one has light enough to break
The gloom that haunts my soul.

Shine on my soul thou star of love,
While that revolves round thee,
And wheresoever thou dost move—
There shall its orbit be.

Though darkness veil the gilded skies,
Yet still there's light from thee;
Night darkens not thy beaming eyes—
Thy smile is day to me.

The Paths of Life.

Two paths hath life, and well the theme
May mournful thoughts inspire,
For ah, the past is but a dream—
The future a desire.

True Politeness.

Never ridicule, or point the finger of scorn at a person because he is less wealthy than yourself. Many a great man and brilliant genius have been the victims of poverty, while accident has raised simpletons and even idiots to stations of affluence and power. The true principle is to treat every person with proper respect, no matter whether he be rich or poor.

The Flemington, N. J. Copper Company have, it is said, recently struck a rich vein of ore, yielding 58 per cent of pure copper.

ELECTRIC IMPROVEMENTS.

Figure 1.

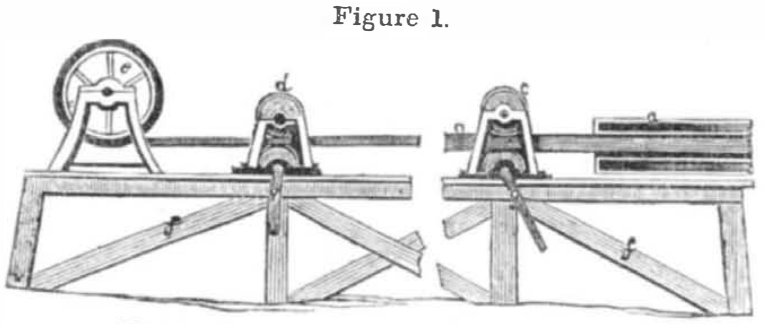

Figure 3. Figure 2.

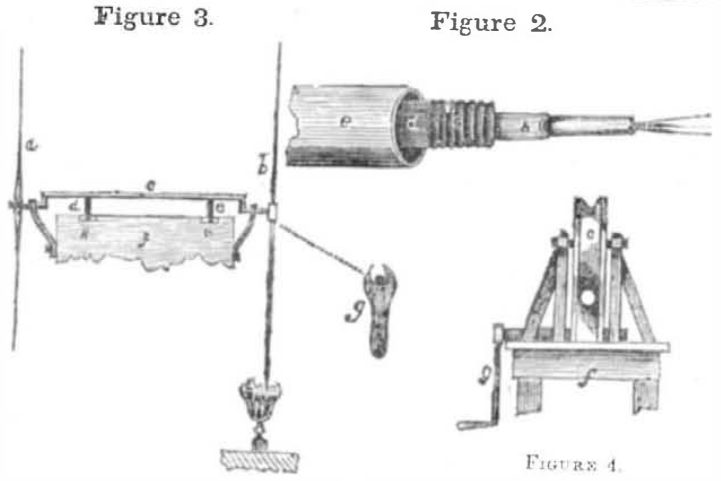

FIGURE 4.

This is an invention of Mr. C. Hill, of London, for improvements in the Electric Telegraph apparatus, and relates to enclosing the conducting wires in tubes of lead and drawing the tubes with the wires in them to an extreme fineness. The wires are dipped in rosin before they are enclosed in the tube. The tube is then filled with hot rosin, pitch and tar, and while these materials are hot the leaden tube is passed through a series of rollers, represented by Fig. 1. The pipe is run through a chamber, A, full of hot water to keep the non-conducting materials hot. The tube O, passes through the centre and then enters between rollers *c*, an end view of which is seen Fig. 4. *f*, is the frame, and *g*, the handle. These rollers have semi-circular grooves in their peripheries which by their junction form a circle about one-eighth of an inch less than that of the external diameter of the tube These tubes, or tube, being made to pass between the rollers by their being driven by hand or otherwise, the lead pipe is reduced in diameter, but increased in length, and then goes through another set of rollers *d*, to reduce the tube still more until it is drawn closely round the wires, when it is received on *e*, a drum. (The tubes might be drawn through draw plates and would answer the same purpose as between the rollers.) The whole is then covered with coarse yarn. Fig. 2, represents the wire at different parts during the different stages. The tube *b*, is exhibited as being wrapped round with the cord *c*, after which it is plunged in a bath of hot pitch and while the pitch is hot it is rolled in sand and rubbed with the hand, filling up all the interstices between the strands of the rope as seen at *d*, and the whole is then further protected by laying it in a cast iron pipe *e*, so that it can carry wires across rivers, lakes or seas. Fig. 3, represents an improvement in steadying the needles used in telegraphs and the means of bringing them to a state of rest, after having been moved to the right or the left. *a b*, are the needles supported on a bent axle *c*, and kept in a vertical position by the lower end being heavier than the upper. The axle is supported by two pins or points *d e*, one of which rests in a conical hole formed in a piece of agate *e*, or other hard substance inserted in the brass frame work *f*, the other point resting in a groove cut in the other piece of agate *k*, in the direction of the length of the axle. The needles vibrating freely from the points *d e*, are prevented from being jerked out of their position from any sudden impulse of the electric fluid by forked arms—*g*, represents a correct view of these arms. These arms *g*, receive the crank axle, the same being in a line with the centre of motion The foregoing is a plan for suspending the needles which are brought to a state of rest by a small cup of oil placed in a position so that when the needle is perfectly vertical, the point of it just dips in the oil, the friction of the point passing through the oil when it vibrates and its vibration thus arrested. This object, however, may be effected by filling the cup with filings, the point of the needle coming in contact with them, or a small block of iron will answer just as well as the cup of oil.

As the science of Electro Telegraphing is but young and now engages much attention, there is something in every new patent to interest electro scientific men. Mr. Hill constructs his magnets by winding his wire round a thin cylinder reel, then he introduces his soft bar of iron into the reel and applies his electrical current in such a manner as will tend to draw the soft bar through the centre of the reel. The usual way to make these magnets, is to wrap a coil of covered wire round a core of soft iron, which is magnetised by transmitting a current of electricity through it, the perfect filling of which depends upon the purity of the core. It will be understood that the magnet must be somewhat less in diameter than the cylinder or reel, in which it is to be enclosed.

An Antique.

A plain gold ring was found by workmen who were digging a culvert on Ferry wharf, Boston, a short time since, which had on it the following inscription: "J. Fitch, ob't. Oct. 26, 1739, Æ 27."

Opposition to the Telegraph.

The news of the Revolution in France was carried by an express locomotive from London to Glasgow, 472 miles in 10 hours. The average running time being fifty-two miles an hour.

RAIL ROAD NEWS.

The legislature of this State has passed a general Railroad law, under which capitalists may associate to construct railroads, without the right of eminent domain, however.

The Northern Railroad Company have lately applied to the Legislature for a bill authorising them to bridge the outlet of Lake Champlain. It is highly probable that the request will be granted, and that the work will be immediately put under contract. The proposed bridge, when constructed, will establish a perfect connection between that road and the roads in Vermont.

Atlantic and Pacific Railroad.

Should the treaty with Mexico be ratified, we predict that not many years will pass, before the two oceans will be connected by steam power, via the Rio Grande Nature has done her part towards the improvement, and art will yet do hers. There are no great physical obstacles to be overcome, as is the case further south, whether at the Isthmus of Tehuantepec or that of Darien.

From the Paso del Norte to the mouth of the Gila, on a direct line, is about 600 miles. The best practicable route for a road from the most accurate information we have been able to obtain, will not exceed 800 miles—making the whole distance from the Gulf of Mexico, via Paso del Norte, to the Gulf of California, 1300 miles.

The head waters of the Gila are directly west of Paso del Norte; second they are only distant 115 miles; third, that there is already a high road opened, not only to California, but also through the state of Sonora, to the lower end of the Gulf of California; fourth that the Gila is a rapid mountain stream, 30 feet wide and in the shoalest places one foot deep, (and this at extreme low water, as we learn elsewhere,) and must therefore afford ample water for a large canal which might be made from this point down the Gila to the Gulf of California; fifth, that a Railroad could be made without difficulty, connecting Paso del Norte and the Gila. The mountains between the two oceans are not very high, they can easily be surmounted by American genius and enterprise.

Quebec Railroad.

A bill has been introduced into the New Brunswick House of Assembly which proposes the issue of £100,000 in Provincial scrip, bearing interest at 6 per cent, and redeemable in thirty, forty and fifty years, to be loaned to the Company formed for the construction of the St. Andrews and Quebec Railroad.

Champlain Railroad.

A meeting of the directors of the Ogdensburg and Champlain Railroad was lately held in Boston and the most energetic measures taken for the early completion of the whole work. Sixty miles of the road will be ready for the rails the early part of next autumn.—A portion of the remainder in the month of April following, and all by the first of July succeeding.

A Railroad is to be built between the towns of Lawrence and Manchester in N. H.

The Massachusetts Legislature have granted a charter for a railroad between Salem and Lowell.

Mr. Ellett, the engineer and contractor of the Niagara Suspension Bridge has stated that by the 1st of June next the work will be so far advanced that he will be able to cross on horseback.

Several new Telegraphic lines are to be put up between Buffalo, Detroit, Chicago and other lake towns.

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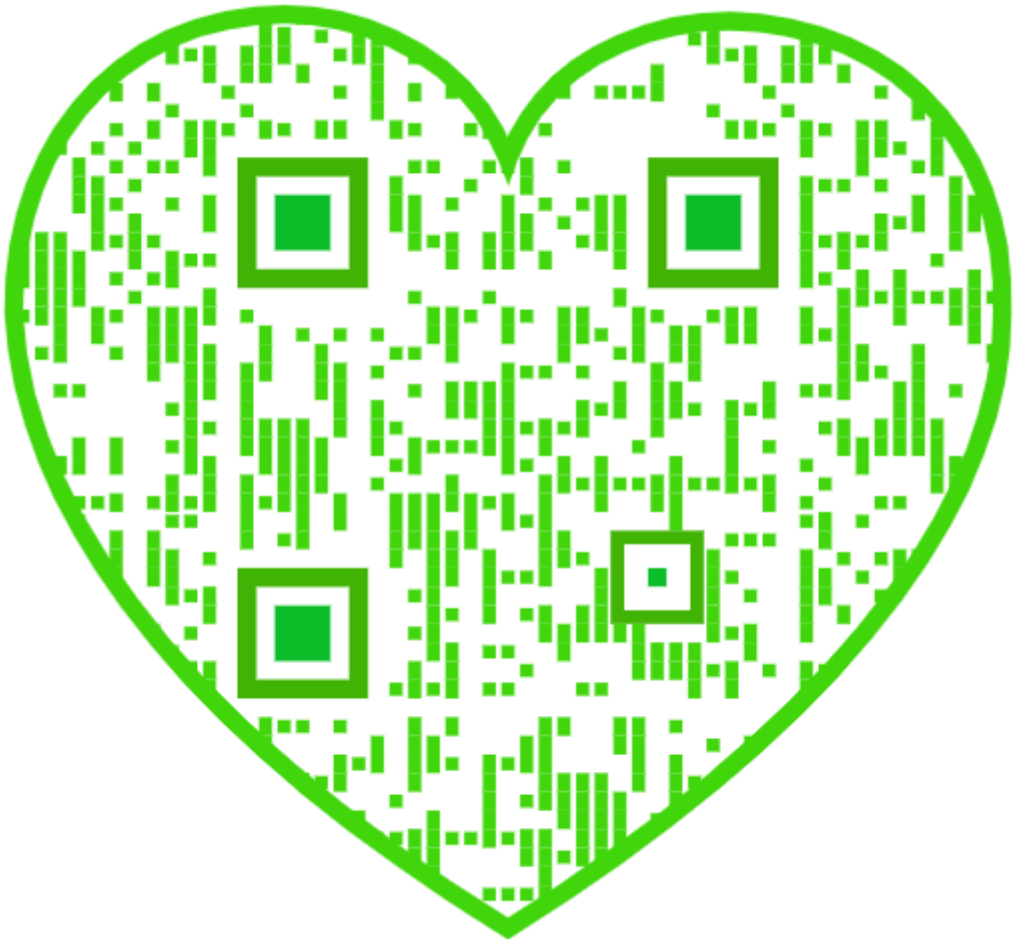

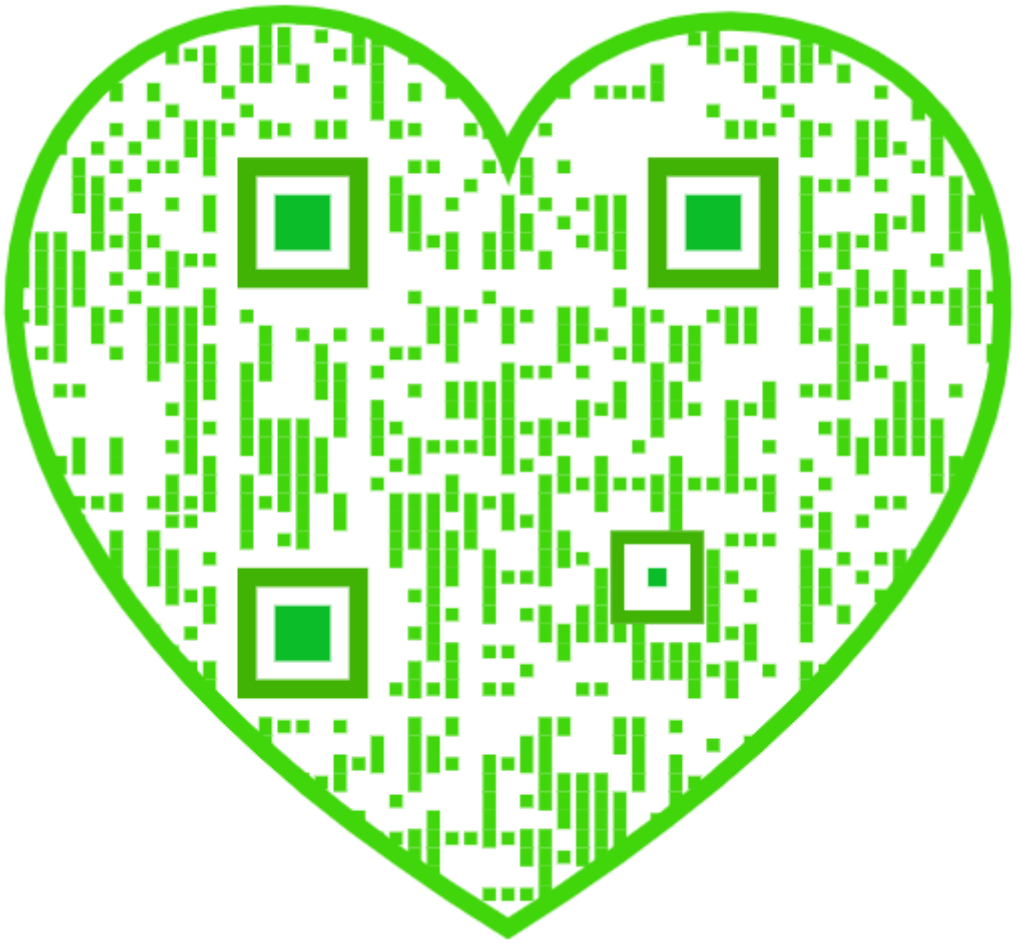

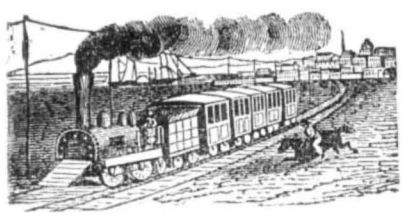

Recent Fires.

A fire broke out in the Sugar House at the corner of Broadway and Duane st., last Sabbath morning. We are sorry to add that one of the walls fell down, killing almost instantly one of the assistant engineers, Mr George Kerr, and killing instantly Mr. Henry Fargis, foreman of No. 38. A great number were also severely wounded. No less than 47 fires occurred in our city last month, and some of them were very serious. New York has been called the city of fires ; we have too many sheds and fugitive structures, and this is the cause of frequent fires.

A large Grist and Flour mill has been burnt down at Cohoes Falls, N. Y. Loss $20,000.

On March the 28th, the Home Printworks at Central Falls, R. I., were the scene of a terrific explosion of a boiler, and ten persons lost their lives.

On March the 3rd, a most disastrous fire occurred at Watertown, N. Y., and much property destroyed and two lives lost.

A boiler lately exploded in Lewis Street, Boston, and killed Mr. McLaughlan the engineer, and scalded a workman.

The cotton factories at Amoskeag, N. H. were burnt down lately. The fire is said to have caught from some defect on the chimney.

A small satinet factory, situated about a mile and a half east of the village in Leicester, on the road to Worcester, Mass., took fire two weeks ago from friction in the picker, and was entirely consumed with most of its contents.

We might fill a number of pages with such disasters, but we have no feeling to dwell on such sad events. We point to these accidents and only say to our people be *more careful*, for we are convinced, that many accidents, though not all, are the result of carelessness.

Splendid Fire Engine.

Mr. Andrew Agnew, of Philadelphia, has lately built a most magnificent Fire Engine, named the Vigilant. The body is of highly polished American walnut, with pretty pannelings, enriched by elaborate silver corner pieces and mouldings, and having centre pieces of rich and ornate design. The gallery baffles description. It presents the appearance of a great and gorgeous silver vase, tinted with gold. It is supported by four enfoilated columns of choice workmanship, which, while they give the design no heaviness, remove the notion of mere tinsel or tawdriness. The wheels and arms are of polished hickory ; and the levers are polished metal. The levers are worked from the ends and sides, by means of arms so adjusted that the members stand upon the ground. The levers fall upon metal spiral springs of which material also the hubs and axles are made ; the hub, besides, forming and comprising the box. The water is let in at the bottom of the box ; above which the valves are placed, and the side apertures for the reception of the hose and the discharge of water are said to be of a greatly improved character.

A Precious Volume.

A princely bequest has been made to the British Museum, by the Hon Thomas Grenville, of London, lately deceased. It consists of a rare and valuable collection of books, exceeding twenty thousand volumes, and valued at 100,000 pounds. Among them is a copy of the *Bibla Sacra Latina*, on vellum, the first book printed with moveable types. It was printed at Mentz in 1450-5, by Guttemburg and Faust. This edition is called the Mazarin Bible on account of a copy having been found in the library of Cardinal Mazarin. This is so rare that but four copies in vellum and fourteen on paper are known to exist, all of which are in public libraries.

Earthquake at Batavia.

Letters from Batavia, in the Island of Java. of Feb. 20, state that on the 16th, 17th, and 18th, shocks of earthquake were felt at Batavia, and in the regencies of Cheribon, Bonjoemak, Kaddock, Samarang, ond Rambay. At Batavia, the towers of the church were a good deal shaken and that of the town-hall had taken a strong leaning to the left, whilst a cross in cast iron, which surmounted it was overthrown. In the town of Cheribon all the buildings except the stores, the walls of which are of great thickness, were so much injured as to threaten destruction, and oblige the inhabitants to seek refuge in the plains of the environs. At Parimang the residence of the Governor was thrown down, and all that it contained destroyed. Forty houses in the Chinese quarter shared the same fate, and seventeen inhabitants were crushed to death under the ruins. A great number of sugar and indigo manufactures in the open fields were destroyed. Intelligence from all points of new disasters was reaching Batavia, and the greatest alarm prevaled in that capital.

The Doom of our World.

The North British Review, says :—"What this change is to be, we dare not even conjecture, but we see in the heavens themselves some traces of destructive elements and some indications of their power. The fragments of broken planets—the descent of meteoric stones upon our globe—the wheeling comet wielding their loose materials at the solar surface —the volcanic eruptions of our own satelite —the appearance of new stars and the disappearance of others are all foreshadowed of that impending convulsion to which the system of the world is doomed. Thus placed on a planet which is to be burnt up, and under heavens which are to melt away, thus treading as it were on the cemeteries, and dwelling on mausoleums of former worlds, let us learn the lessons of humanity and wisdom, if we have not already been taught in the school of revelation."

The Bonaparte Family.

The only surviving brother of the late Emperor Napolean, Jerome, is we believe, now in France, having asked leave of Louis Philippe, some time since, to reside in the kingdom. He will be remembered as having married Miss Patterson of Baltimore, about 1803, and by that lady he left a son, now, we believe, living in Maryland Jerome repudiated his wife, by direction of his brother, and afterwards married a German Princess. He was for sometime King of Westphalia.

Louis Napoleon son of the late King of Holland, Louis Bonaparte, and of Hortense, daughter of Josephine, lately escaped from prison in France, and has now returned there from England, on hearing of the Revolution.

A Fatal Carouse.

In the devastation and burning of the chateau of Neuilly some bandits rushed into the apartments, whilst others went to the cellars, The latter there found wine of all descriptions and a cask of rum, which they broke open. Some instants after they were all drunk, and then a terrific battle took place between them, their principal weapons being bottles. At length they fell to the ground overcome by intoxication or wounds. Meanwhile the men who went into the apartments ravaged and pillaged them completely, after which they set them on fire, and the whole building was soon in flames. A short time after, the men in the cellars were either burned to death or suffocated. On Sunday from one hundred to one hundred and twenty dead bodies were dug out.—*Journal des Debats.*

Tea Plants.

An enterprising citizen of Charleston, S. C., has just received from Canton, from an embassy to that country, six varieties of the seed of the Tea plant, together with directions for its culture. The seed resembles in some measure the small sized ground artichoke.

Steel.

Of all bodies steel is the strongest. It requires a force of 115,000 lbs. to tear asunder a tempered steel rod the area of which is one inch.

The Atmosphere never Dark on a Windy Night.

Several years since, says a writer in the Magazine of Natural History, when travelling by night in the mail coach, in the depth of winter, and during the absence of the moon, I was surprised to observe, that though dense clouds covered every part of the horizon, and not a single star could be seen, yet the night was far from being dark, and large objects near the road side were easily discerned. On expressing my surprise to the driver, he replied, "The wind is very high, and during a great many years that I have been upon this road I never knew it to be dark on a windy night." The observation was at that time new to me ; but subsequent experience has convinced me that it was true.

Strange Phenomena.

A correspondent of the Buffalo Daily Express states that the water at Black Rock fell in one night, the 28th ult., three feet, and no evident cause for the same. At Niagara Falls on the same night, the water that fell over the Falls looked more like a mill dam than the mighty waters of Niagara River. On the night mentioned above, all the mills at the Falls were suspended for want of water, which had caused no little astonishment and well it might if the story is true.

Iron Convention.

The Iron Manufacturers' and Miners' State Convention met in Harrisburg, on Wednesday, last week. It was a very respectable and intelligent body. Delegates were in attendance from various states. A number of resolutions were passed, and Committees appointed te collect statistical information with regard to the Iron and Coal trade, the consumption of Agricultural products, &c.

The Wooly Horse.

The wooly horse caught on the Rocky Mountains and which has been exhibiting in some of our Southwestern Cities, is the very animal caught by Baron Munchausen, and which has the strange quality "that it can't live on land and dies in the water." It will soon visit this city and its coating of pitch and wool will no doubt be a subject of curious investigation. The above information is for the benefit of all those who love to study the wonders of gullability.

Whitfield's Habits.

Whitfield's habits were singularly nice and cleanly, upon the principle that everything about a minister should be "spotless." He was known to say that he could not die easy if his gloves were out of place. He had the gentlemanly love of order, which required his table to be elegantly spread, even if only a loaf, or his favorite dish, a cow-heel, were to be seen upon it.

A New Way to Make Steamboats Swift.

A steamboat called the Dupont, in Philadelphia, which once had two of Loper's propellers in her, was wonderfully improved lately, by taking one of them out, and leaving the other in.

Query.—Would she not do better with both out.

Anti Assassin Shirt.

The Heraldo, a Spanish paper, states that a man had arrived at Madrid, "whose body bullets cannot enter." He proposed being publicly shot at by the soldiers of the garrison, and also by a machine of his own which lets off several muskets at the same time. He puts on a garment the tissue of which resists the entrance of any bullet.

The Baltimore Mechanics' Fair.

There is to be a grand Mechanics' Fair at Baltimore on the 17th of May next. Mr. Benson, the inventor of the new Rotary Engine is Superintendent. We shall notice this Fair again, and in the mean time bid the Maryland Mechanics get their models all bright and ready.

New Canal.

A new canal is contemplated from Buffalo to the canal dam below Black Rock, N. Y.—The object is to procure a full supply of water to the enlarged Erie Canal, independent of the mill privileges.

The word "apple" in the book of Genesis should have been translated "citron," according to Dr. Parkhurst.

Rome exports its rags and imports them manufactured into paper ; exports its cows and oxen, and imports its butter and cheese ; exports its raw silk, and imports it when manufactured ; exports its raw wool, and imports it again the form of broadcloth ; imports olive oil from Tuscany, and wax and honey from wherever she can get them.

Buffon, says the Journal de Reims, gives a raven's life as 200 years. The other day a gentleman captured one, round its neck was a silver plate, with an inscription in English :—"This raven, caught by Capt. Duncan of the Scotch Guards, in Garrison at Rheims, was set at liberty, Jan. 7, 1643."

A new machine for watering the streets, called Rough and Ready, has been invented in Philadelphia.

We want thousands here, why don't our City authorities put up hydrants with perforated nozzles to lay the dust. Broadway is sometimes like Sahara, in spite of the Croton.

There is a new boat nearly ready for action in this City for the North River trade. She has a stroke of 14 feet long, and her cylinder we believe, is scarcely three feet in diameter. Experience will test either its follies or fame. We are not upon the fence regarding it, although the builder is an eminent mechanic.

At Cologne, a suspension bridge is about to be thrown over the Rhine by French engineers, similar to that which crosses the Danube at Offen. It will rest on a single pillar in the middle of the stream—and is to cost 159,000 thalers.

The Cleveland Herald states that saleratus to the amount of 221 tons or 442,000 lbs., was shipped from that place by the canal last year. There are in Cleveland four manufactories of this article, all of which are doing a good business.

A Swan was caught last month, on the Monongahela River, by James McAnich.—It is pure white, three feet and a half high, and a very beautiful bird.

A number of students have been suspended from the Genessee Wesleyan Seminary, N. Y., for initiating a pedlar by a mock ceremony of Odd Fellowship.

The Peace Society has issued a circular which terminates thus :—"Arbitration is friendly—wise—easy and cheap. War is fiendish—foolish—difficult and dear."

Some excellent sugar has been raised on the St. Johns River, Florida, by Col. McIntosh. One hundred and fifty barrels have sold for 5 cents per pound.

A glass Company has been chartered by the Legislature of Tennessee. An abundance of the best sand for glass manufacture has been found in that State.

The Jackson Committee at Washington, have adopted Mill's plan for a bronze equestrian statue of Gen. Jackson. It is to be made of the cannon captured by Gen. Jackson at New Fort Hamilton.

Mr. F. J. Wood lost his life recently on the Potomac. He went down to the bottom of the river in Captain Taylor's submarine apparatus and in fifteen minutes afterwards he was taken up dead.

M. Boussingault states in the *Annales de Chemie*, that experiments have shown that cattle fatten better on fodder steeped in water than when given to them dry.

Twenty-six thousand lashes were inflicted in the British Navy last year. Forty-eight was the highest number inflicted at any one time.

Bread is selling in England at a lower price than ever has been known ; the best bread is 5½d. per quarter loaf.

A wag put the sign of a cutler one night on the watch house in New Orleans, and the people next morning read the plain fact above the door, "Blades put in here."

In China a man condemned to death can procure a substitute by paying about three hundred dollars.

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For the Scientific American.

The Carpet Manufacture.

(*Concluded from our last*)

In order to preserve as much as possible the form and regularity of the several coils made by each thread and set of threads, around the cylinder, after they are taken therefrom, and during the process of washing and steaming them, it is proper to pass a small cord of worsted amongst the convolutions, under and over them alternately, tying its ends together. This interlacing of a cord across the several coils may be applied at two different places of each set of coils, before they are taken off from the cylinder, and it will facilitate the winding afterwards upon bobbins, as it will preserve the threads from entanglement.

The warp being thus composed of party-colored yarns, suitably variegated with colors and arranged in suitable order in the warp, according to the intended pattern, the weaving is to be conducted in the usual manner of what is called *plain weaving*, and will produce a fabric with a figured pattern in colors *without any of the troublesome manipulations which are necessary for what is called figure weaving.*

According to the ordinary mode of weaving Turkey carpets, the weavers must have in use as many different skeins or clews of different colors as the variegation in his pattern requires, and must select first a skein or clew of one color, and then another, with discretion to suit his pattern; he will, according to this improved mode of Mr. Whytock's require to use only *one* skein or clew of yarn, which, being rendered party colored in due order of succession of colors, will furnish all the variation of coloring necessary for forming the successive tufts which he will require in his work, and following each other in due order as they will be wanted. And as he works up the skein or clew of party-colored yarn by putting in tuft after tuft, and cutting off the yarn each time, those successive tufts will change their color according to the intended order of succession of colors which the pattern requires, without any trouble of selecting colors and changing skeins with *perpetual* reference to the pattern, as heretofore, but only occasional references thereto, and without the same liability to mistake in so selecting, and the waste of colored yarn which is occasioned by such mistakes: and also, the number of ends remaining from the number of skeins which must be used, will be much diminished by rendering the yarns party-colored. By this mode of party-coloring the yarns, the joinings of the patches of color which were applied successively, will indicate the exact place where the yarn is to be cut off as the tufts are introduced, whereby waste of material in cutting off too long may be avoided, as well as imperfections in the face of the work by cutting off too short. [Note.—A saving of coloring material may be made in rendering the threads for Turkey carpets party-colored, by omitting to apply any color to those parts of the yarns which are afterwards to be looped or knotted around the threads of the warp, and which parts will therefore only appear at the back of the fabric, and will consequently require no color; these omissions can be easily made in their proper places along the party-colored threads, by setting out the pattern so that those parts of the threads will be known when they are wound round the cylinder, and may be passed over without applying any coloring matter thereon. The places which are left uncolored in the threads will be *extremely useful* as indications to the weaver of the places where the tufts are to loop and knot around the threads of the warp.—GILROY.

The Size and Age of Trees.

The traveller Adamson discovered in India a baobab tree to which the largest oaks would be mere saplings, and the stem of which measured from 80 to 120 or 130 feet in girth. As they could not cut a tree down every time they wished to ascertain its age, they measured it, and thus formed an approximate guess. They thus came to the conclusion that baobabs existed for five thousand years. The celebrated cypress of Mexico was at least as old, if not older still than these. It must be remarked that the deluge did not destroy the trees, since the dove brought to Noah a branch of the living olive tree. Records still exist in the library at Milan, by which it was ascertained that a cypress which grows in that city was in existence in the time of Julius Cæsar. Now that tree is only twenty six feet in circumference while the Mexican cypress was 120 feet. There was nothing in the constitution of trees at present existing to prevent their living on to the end of time, whether measured by hundreds or thousands of years. There has been exhibited a section of the largest branch of a yew tree which grew at Forthampton, Gloucestershire. It was nine inches in diameter, yet 228 perfect and distinct rings could be counted in it. Decandolle from an examination of a number of yew trees, ascertained that the average amount of its growth laterally was three-twelfths of an inch in a year. The circumference of the whole tree was twenty-seven feet, and hence its age would be 1370 years. This lands us in the time of the Saxons; and we have not the least doubt that there are yews still in existence which began to grow long before the Romans marched over Britain. At Fortingal, a village among the Grampians in Scotland, there is a yew tree the age of which must be more than 2,500 years. It is evident that, as the vitality exists in the *liber*, the tree can go on constantly pushing forth its fresh rings of wood, when the centre is dead: the vital principal is still working, and seems as if it could go on forever.

Protecting Wall Fruit From Insects.

The ant occupies a distinguished position as a depredator on wall-fruit. No sooner has an insect "of a larger growth" commenced the destruction of a fruit than these little pests assemble in myraids and complete the demolition: and this is often carried on by means of a minute aperture in the cuticle of the fruit next the wall, so that some of our finest fruit is often destroyed ere we become aware of the fact. The usual wasp-trap is of little or no service in the destruction of the ant, and even muslin bags, so effectual for the exclusion of flies, &c., are often ineffectual. The best remedy for the prevention of the attacks of the whole insect race is common tow or hemp. As soon as the fruit, from its ripeness, begins to become attractive envelope a thin coating of this substance, packing it well between the fruit and the wall, and no insect will venture to molest it. The fine filaments of the hemp form a complete *chevaux de frise* to their attacks. Even the minute ant fails to penetrate them. A fine crop of peaches, which were required to be preserved for a particular occasion was treated in the manner described, and out of several dozen from one tree, not one fruit had the least blemish from the attack of an insect.

Egypt and her Ancient Arts.

The hieroglyphic system of Egyptian writing, like the Sanscrit of India, was sacred. It was the most ancient of all lang ge and is the depository of the records of the monumental annals of a mighty empire. In its nature it was alphabetic, symbolic and pictorial. Its meaning was conveyed through the medium of *sounds*—the *names* of things, and *pictures* of the things themselves. The representation of a lion, for example, might, as a symbol, mean the animal itself, or it might convey the qualities of his power, or alphabetically, it might express the letter L. These three modes of hieroglyphic writing were used singly or together, and were incident to great obscurity from this undermixture. All of the sculptural history of Egypt is transmitted in this system.

For the recording of continuous events, leaves of the Papyrus, an aquatic plant of the Nile, and slips of fine linen were used. Numerous rolls of this species of manuscript are found in all the temples and tombs, and their secrets have been revealed by science. Champollion perfected a key to the entire system. The process was to decipher the characters—next to interpret the words they formed. To accomplish this last process, it was necessary to refer to the ancient Coptic language.

The excavations of the French explorers exhumed a new book of Monumental Egyptian history. Upon the immense walls of the tombs and temples were spread out pictorial or sculptural representations of all the economy of Egyptian life, with the arts and occupations, customs and costumes of all grades, vocations and professions. Volumes could not have contained such exact and copious details of the most minute facts and events in Egyptian history. The entire social economy of the Egyptians, 1800 years B. C., with a delineation of all their mechanical vocations and the progress of artisans thus set forth with wonderful truthfulness and vividness, are faithfully represented in Rosselin's Plates of monumental history. These pictorial delineations prove that many arts which have been supposed unknown to antiquity, were as well understood then as at the present day. The manufacture of glass and porcelain, and of fine linen—the imitation of precious stones with glass, and the staining of that material, afterwards for ages lost. Thebes, 4,000 years ago, if less advanced than the 19th century in some respects, is thus proven to have far surpassed it in others. Astronomical discoveries and tables prove, also that the wise men of Egypt must have possessed the art of bringing scientific instruments to a high degree of perfectness; and the minutest sculpturing on some of the hardest porphyry, demonstrate that the artisan's tools must have possessed the keenest edge and most exquisite temper. The principle of the Artesian Well as also that of the Railway, was plainly known and practised. The engraving of cameos, the tempering of copper, and the manufacture and use of burning glasses, were also known; while the elevation of the enormous lintels on the domes of the temple of Carnac, and the position and removal from great distances of other vast and ponderous masses of stones, prove the possession of motive and mechanical powers now lost. The motive principles possessed by the Egyptians could not be so applied at the present time. By means of these powers and arts, were constructed those mighty and mysterious masses of architecture which have been the wonder of all subsequent ages—those giant sentinels of the dead past,—labrynths whose rocky masses imitated the heaveniy zodiac—huge statues with the semblance of the shadowy phantoms of a Titanic race, and whole temples of siennite marble, transported a hundred miles from its bed!—and the dread and awful pyramids, next to the works of Omnipotence, the mightiest on our earth. Yet, all these, to the spectator, gazing down from the summits of the porphyry mountains of the Nile, seem but the fragments of the architectural skeletons of an elder time, whose spires glitter amid the blue heavens, but whose depths were based in blood.

Coal on the Pacific Coast.

The Valparaiso Neighbor of October, 1847 says:—The prospects of obtaining coal from the neighborhood of Conception have lately become very fine. By the last accounts the promise was excellent both as to the amount to be had, and as to quality of the coal. A gentlemen writing from Talcahuana states that one mine has been opened on land lying at the right hand of the road leading to Conception, in which a seam of coal has been found one and-a-half yards thick. In the tide way of Phinco they are working another, some 200 yards from the beach, and have cut vertically to the distance of ten feet. And have not passed the coal even at that. Then a third has been opened at the Pareles, also on the side of the road to Conception. The coal obtained from this is of most excellent quality. In all there are now five mines, and the main question at present is to find a purchasing demand equal to the supply.

Longevity.

There is nothing in the system of nature, which, in our present state of knowledge, appears so unintelligible as the scale of longevity. It must be admitted, indeed, that our knowledge, upon this subject is very imperfect, for all that is known of domestical animals, and the accidental facts which have been preserved concerning others, tends to the strange result, that longevity bears no relation either to strength size complexity of organization, or intellectual power. True it is, that birds, which seem to rank higher than beasts in the scale of being, are also much longer lived. Thirty is a great age for a horse: dogs usually live from fourteen years to twenty; but it is known that the goose and hawk exceed a century. But fish, evidently a lower rank in creation than either, are longer lived than birds; it has been said of some species, and certain snakes also, that they grow as long as they live, and as far as we know, live till some accident puts an end to their indefinite term of life. And the toad, it cannot indeed be said that the toad lives forever, but many of these animals who were cased up at the general deluge are likely to live till they are baked in their cells at the general conflagration.

Decease of a Mechanic Naturalist.

There lately died on his passage from New Orleans to Liverpool John Miller, who had been for sixteen months in our western wilds collecting and preserving rare specimens of birds, reptiles, insects, &c. Though only a working man, and laboring under the disadvantage of poverty, and a very limited education, he displayed a skill and shrewdness in the pursuit of his favorite study, which stamped him as a man of very superior abilities and natural talents. Through a strong desire to explore different parts of North America in quest of birds and other natural curiosities, he contrived to save a few pounds by dint of rigid perseverance and economy, and sailed from Liverpool on the 17th of September, 1846, in pursuit of his favorite object. He remained eight months about St. Louis, in killing and preserving animals, supporting himself during that time by preparing and selling specimens amongst the inhabitants. The assiduity with which he followed his pursuit, and the variety of climates he had to encounter, brought on an illness, under which he labored six months, gradually growing worse: in which condition he embarked at New Orleans for England, and died after being about a month on the passage. The specimens of curiosities he had acquired, consisting of birds, insects serpents, and other things, have been carried to Liverpool.—He left a widow and seven children.

Schiller's Use of Bodily Suffering.

I have often been acquainted with persons both men and women, in whom this condition of (constant bodily suffering) was habitual, and who had not even a single probable hope of ever getting free from it unless by death. To this class, especially, Schiller belonged. He suffered much, suffered constantly, and, knew too, that as was actually the case these perpetual pains were drawing him nearer to death. Yet of him it might truly be said, that he kept his sickness imprisoned within the limits of his body; for at whatever hour you might visit him, in whatever state you might find him, his mind was always cheerful and tranquil, and ready for friendly intercourse, and for interesting and even profound conversation, He would even say, at times, that a man could work better in certain states of bodily aliment,—not those, of course of acute suffering, and I have found him, while actually in this uncomfortable condition, composing poems and prose essays in which no one, surely, could discover a trace of this circumstance of their birth.—*Letters by W. Van Humboldt.*

The Bond of the House.

The English term "husband" is derived from the Anglo-Saxon words *hus* and *band* which signify the "bond of the house;" and it was anciently spelt *house-bond*, and continued to be spelt in some editions of the English bible, after the introduction of the art of printing. A husband then, is a house-bond—the bond of a house—that which engirdles the family into the union of strength and the oneness of love. Wife, and children, and "stranger within the gates"—all their interests and all their happiness are encircled in the *house-bond's* embrace, the objects of his protection, and of his special care. What a fine picture is this of a husband's duty, and a family's privilege?

The old house in which Louis Phillippe lived in Philadelphia has just been torn down.

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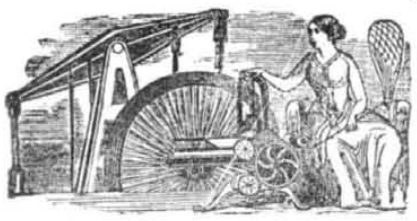


New Inventions.

New Cloth Measurer.

Mr. A. A. Erskine, of Eaton, Madison Co., N. Y. has invented a new and simple apparatus for measuring and rolling narrow cloth at one operation. The cloth is taken from the press and placed upon a cushion in the machine, from which it passes to a drum one yard in circumference where it is measured, and passes thence among friction bars to a shaft where it is rolled up in a nice square roll ready for the market. While it is being measured and rolled up the papers are deposited upon a shelf in a nice compact pile.—This machine saves all the time generally bestowed upon cloth after pressing, except starting the machine and registering the number of the piece and number of yards, for it may be left with perfect safety to perform its work. It has been used about six weeks, during which it has been examined by manufacturers and others and approved by all. It is very simple and can be got up in good style and warranted to work well, for fifty or sixty dollars delivered without transportation. Measures have been taken to secure a patent.

New Screw Driver.

We have received drawings from Mr. L. V. Badger, of Boston, of an improvement in Screw Drivers, which we think is valuable and exhibits not a little ingenuity. It is a plan of a driver for screwing up large screws and gives all the power that is required for that purpose, something which the common screw drivers lack, unless they are made too large for quick and neat workmanship. We may be able to present at some future period an engraving of this neat and convenient tool.

Improvement in Sawing Machines.

Mr. Daniel Woodbury, of Perkinsville, Vt., has invented a machine for irregular sawing, such as circles and bevelled work and for cutting timber for ship building, which from its great simplicity and apparent utility, we consider to be very valuable. It is not so complex as Cochrane's and it requires no great expense to attach it to any sawmill. The bevel is regulated by a moveable circular frame and bevels can be cut to any degree with the utmost accuracy.

Steam for Extinguishing Fires.

Some experiments have been made this and last week in Williamsburg near this city, to show the superiority of using steam in place of water for extinguishing fires. Mr. S. Broadhead is said to have a patent for this discovery and the experiments were to test its merits. A large tar barrel was filled with combustible materials and set on fire, being well supplied with air through holes bored in the sides. A tube from a steam boiler under a pressure of sixteen pounds conveyed the steam through a hole in the bottom of the burning barrel and the flames were instantly extinguished.

The invention is ostensibly for extinguishing fires in vessels and the patentee's plan is to distribute tin tubes through the steamer, any one or more of which may be connected with the vessel's engine, and made to throw a head of steam into any part where there is fire, or where it is supposed to be, if its actual location cannot be ascertained. The cost of fitting up a large ocean steamer with an apparatus for instantly drowning out of fires in any part of her, is estimated at $300.

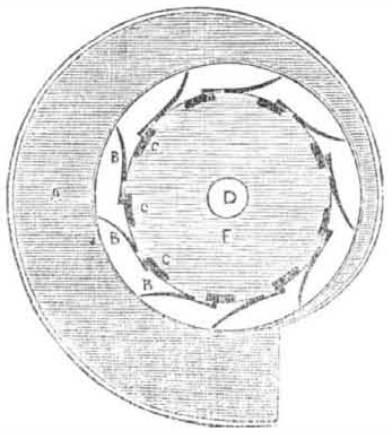
The principle of superiority in steam over water for extinguishing fires lies simply in the sudden expansion of the compressed steam, a principle long known and frequently experimented with for this purpose, but with very faint hopes of being extensively adopted.

Stannate of Tin.

Mr. Church Greenwood, of Lancaster, England, has taken out a patent for some new chemical agents to be used in the dyeing and printing of cotton and woolen fabrics. Two of these agents are stannate and stannate of tin. The stannate is made by putting into an iron crucible heated to a low red heat 22 lbs. of caustic soda, 8 lbs. of nitrate of soda and 4 lbs. of common salt. The mixture is gradually raised to a fluxing heat and when deflagration takes place 10 lbs. of *dropped block tin* is added and the whole stirred with an iron rod This compound when cool is powdered for use or it is evaporated and crystalised and has only to be dissolved to make one of the best mordaunts ever used.

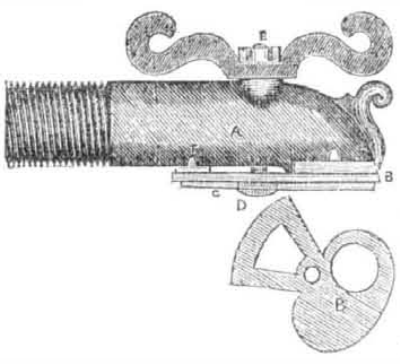
Another process is to take 4 lbs. of common salt, 13½ lbs. of sal soda and 1 lb. of nitrate of soda. These are to be raised to a red heat in an iron crucible and 4 lbs. of the dropped or foliated block tin added. These salts make most excellent dyer's liquor and we hope to see them adopted in our manufactures.

Teller & Dillenback's Improved Water Wheel.



This is a sectional view of Messrs. Teller & Dillenback's Moveable Bucket Reaction Water Wheel. This wheel was described and its principle explained in No. 18 of this volume of the Scientific American. This engraving gives the exact shape and position of both the stationary and moveable buckets in combination. It is a vertical wheel and the water is admitted through the scroll A. D, is the shaft. B, represents the stationary exterior buckets and C, the *vanes* or slides that can regulate the discharge. It will therefore be distinctly observed that the speed of the wheel can be kept up at the same rate by always having the scroll full, although the quantity discharged may be varied as desired. This is a most important improvement in having a uniform speed, although there may not be a uniform supply of water.

Improvement in Faucets.



This is an improved Faucet invented by Jeremy W. Bliss, of Hartford, Conn. Its value and importance will be fully understood by the following description of its mode of construction and operation.

B, is a valve working under the mouth of the crooked nosed pipe A. D, is a hub, in which is secured a bolt, extending through the pipe and handle or thumb-nut, and tightened by a nut at E. F, represents an inclined plane or wedge, connected with the pipe, which serves to compress the valve against the mouth of the pipe, when closed. C C, represent ribs on the under side of the valve, for strengthening the same The valve is worked by the handle or thumb-nut.

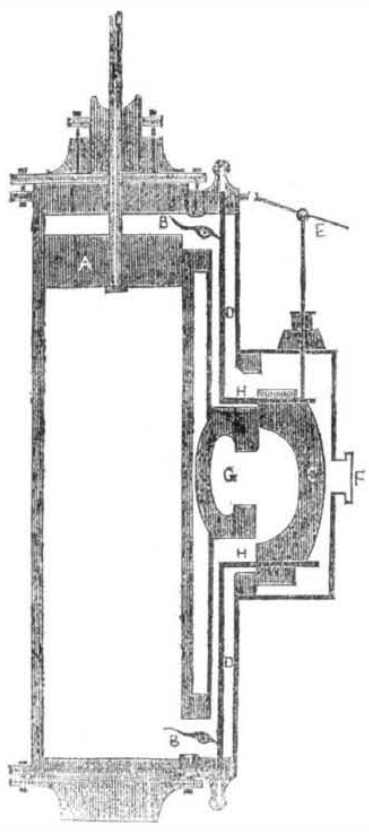
Measures have been taken to secure a patent on the above.

Wheat Dibbling Machine.

Mr. Conway, of Warrington, Lancashire, England, has invented a machine for dibbling wheat so as to supersede the broad cast sowing. It is generally admitted by practical men that dibbling or setting wheat is not only the best, producing the most profitable crops, but effects a great saving of seed. The only objection against dibbling, as compared with the present system of broad cast, being the amount of labor absorbed. Much opposition has been manifested by the working classes of England against his machine, as it performs more work than thirty men by hand dibbling, but it seems that although it does a great deal of work it requires much attention. At a public meeting in Warrington Mr Conway, by the aid of his machine, performed in twenty five seconds as much work as took two expert dibblers seven minutes and a half—thus proving to a demonstration that it would do all that the inventor promised. The meeting was quite astonished at the novelty and easy working of the machine, as it requires no stooping, the man working it while standing in an upright position. After inspecting the machine, the meeting came to the following resolution: "That it is the opinion of this meeting that the wheat dibbling machine invented and constructed by Mr. Conway, will answer in a remarkable degree all the purposes for which it was invented, and is a very important improvement upon the present system."

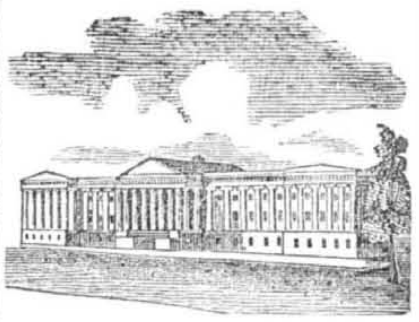
Such a machine, however, could not be profitably used in America, broad cast is more profitable by far here than all the benefits derived from dibbling.

Lever Valve Engine.



This engraving represents the mode of operating the valves of the engine referred to in a previous number of the Scientific American. It is the invention of Mr. William Mack of Canandaigua, N. Y. who has one engine of four horse power in operation. We mentioned before that measures had been taken to get a patent. This engraving represents a single valve and explains the principle fully.

A, is the piston working in the cylinder and the piston rod through a stuffing box. B, are staples that operate the lever D and valve C. It will be observed that when the piston A strikes B, the connecting rod D immediately operates the valve C, by sliding it down when the steam is exhausted by the channel H, and it escapes through the opening G F, is the induction or feed pipe that admits the steam into the steam box by which it is immediately applied to the piston, as represented in the engraving. The passage for the feed and exhaust are much wider than those in common use—this is a necessity for the play of the lever staples B, which are screwed fast in them. E, are levers for reversing the motion, which can be done with great ease and speed. The valves themselves or itself, is the common slide valve principle, the most simple and best valve of all, and just remove the pressure of the steam altogether from acting on it but in the one direction, and it is perfect.



LIST OF PATENTS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending March 28, 1848.

To David Bruce, Jr. of Williamsburg, N. Y., for improvement in Type-smoothing Machines. Patented March 28, 1848.

To Edward Kellogg, (administrator of Geo. C. Kellogg, deceased,) of New Hartford, Conn. for improvement in Wool Pickers. Patented March 28, 1848.

To Edward S. Blake, of Allegheny Co., Penn., for for improvement in Electrical Machines. Patented March 28, 1848.

To Benjamin F. Shelabarger, of Mifflintown, Penn., for improvement in Joiners' Planes. Patented March 28, 1848.

To David George, of Granville, Ohio, for improvement in Hollow Augurs. Patented March 28, 1848.

To James R. Stafford, of Cleveland, Ohio, for improvement in Cooking Stoves. Patented March 28, 1848. Ante-dated Sept. 28, 1848.

To William M. Gooding, of Newark, N. J for improvement in Wrought Nail machinery Patented March 28, 1848.

To William Blage, of Sharon, Ohio, for improvement in fire and weather proof compositions or Artificial Slates. Patented March 28, 1848.

To Lewis Tupper, of Genoa, N. Y. for improvement in Washing Machines. Patented March 28, 1848.

To Sylvester M. Pye, of Acquackanock, N. J., for improvement in Fastenings for Doors.—Patented March 28, 1848.

To Isaac Knight, of Baltimore, Md., for improvement in the running gear of Railroad Car Wheels. Patented March 28, 1848.

To Elijah Murray, of Paducah, Ky., for improvement in Windlasses. Patented March 28, 1848.

To J. Bishop Hall, of Philadelphia, Penn., for improvement in painting on translucent surfaces. Patented March 28, 1848.

To Lewis Smith, of New York City, for improvement in machinery for splitting Match Splints, (having assigned his right, title, &c. to Benona Howard) Patented March 28, 1848.

DESIGNS.

To William P. Cresson, David Stuart and Jacob Beesley, of Philadelphia, Penn., for Design for Stoves, (said Stuart and Beesley having asigned to said Cresson.) Patented March 28, 1848.

To Philip Garbielle, of New Orleans, La., for Design of Bust of Gen. Z. Taylor. Patented March 28, 1848.

INVENTOR'S CLAIMS.

Gas Pipes.

By Joseph Battin, of Philadelphia, Penn. Improvement in Hydrostatic Stops for Gas Pipes. Patented 18th September, 1847. Claim—Having thus fully described the nature and operation of my hydrostatic gas stop, what I claim as new therein and desire to secure by letters patent, is the manner in which I have arranged and combined the respective parts thereof so as to effect the purpose herein named, that is to say, I claim in combination the use of a tank furnished with a partition which shall operate as a water trap or seal, and with a tube for supplying and drawing off the water, the gas being admitted into the upper part of said tank, and the whole arrangement and operation being the same as that herein described and represented. And I do hereby declare that I do not claim either of the parts of which said seal or trap is composed, as itself new; but I limit my claim as above set forth, to the particular arrangement of said parts so as to adapt it to the performance of the office for which it was designed.

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NEW YORK, APRIL 8, 1848.

Iron.

Iron is the most valuable of all metals : and although it is not estimated to be of equal value with gold, yet our remark will not be invalidated for incorrectness, any more than if we compared coffee or spirits with pure water by a just standard of intrinsic worth. Iron has the remarkable property of being welded, in other words, two separate pieces of iron, like the fabled serpents of mythology, can be united together by heat and the action of the hammer. Platina alone of all other metals, has this same quality. This is one property in iron which makes it so valuable, because it can be forged into so many different shapes. It is therefore used for almost every purpose, such as house building, ship building, machinery of every description, in medicine and for coloring. Within the past ten years iron has been applied to a greater variety of purposes than ever could have been anticipated by the most sanguine philosophers of old. To some of these applications, namely, bridge building and tunneling, we would desire to direct attention for a few moments.

Suspension bridges are no longer problematical, they have been "weighed in the balance and not found wanting." But although success has attended suspension bridges and genius and skill have triumphed over supposed impossibilities, yet no sound practical man can doubt for a moment that there is a limit to the extent of our powers—a line beyond which man cannot extend the sceptre of mechanical dominion—a line beyond which the laws governing practical mechanics, so far as we understand them yet, seem to be suspended. The fall of the Dee Bridge in England aroused attention to the subject on both sides of the Atlantic, and there has been a wise settling down of the Scientific to schemes of perfect practical utility, and not Icarus like, attempting flights to the sun on waxen wings. We would not, however, be supposed to speak a word against experiment, but would only caution against the supposition that experiments successful on a small scale will all be equally so on a large scale. Science and art have now been carried to such a state of perfection that it is almost impossible to define its limits —to point out the line of demarcation which bounds the empire of mechanical genius. Tubular bridges are rising up on the other side of the Atlantic like the mighty works of the fabled Titans. A single iron tube has been thrown over the river Conway in England, which weighed 1300 tons—as heavy as some of our largest packet ships. An iron bridge will soon span the gulf of Niagara, and countries that have been separated for ages by the furious waters of the whirpool will then be linked together by a metal dug from beneath the dust upon which we tread This is truly the age of iron—iron intellect and iron enterprise.

Method of Silvering Cast Iron.

The combination of iron with carbon, cast iron, from the ease with which it melts, and the consequent possibility of taking the finest impressions of form, has come into very extensive application. The art of founding, converts cast iron into enormous arches, columns, cannons, and also into the most delicate bracelets. ear-rings, &c. Unfortunately the moist atmosphere very soon alters the surface of these objects, and it is found necessary to coat them with paint, which gives the cast iron a color which is of itself not very attractive—the appearance of mourning. In the present state of the art of founding, cast iron might easily be substituted for bronze were it not for its sombre appearance, which entirely excludes it. This disadvantage may however, be entirely overcome, from the possibility of plating it with silver ; in fact cast iron may be readily silvered, and equally as well as copper and bronze. The liquid for silvering is prepared in the following manner, viz. :—Cyanide of potassium is introduced into a stoppered vessel, and freshly prepared pure chloride of silver, still in a moist state, added, the whole being covered with water, and shaken violently for some time at the ordinary temperature. An excess of chloride of silver is taken, and should a small quantity of it remain undissolved, a few more of the cyanide are added after some time, taking care however, to avoid having an excess of the latter salt, but always a small quantity of undissolved chloride at the bottom of the vessel. This last circumstance is important, because when the liquor contains too much free cyanide of potassium it is easily decomposed, and moreover does not silver so well ; before employing it, it is filtered, and is thus rendered perfectly clear, iron and a little chloride of silver remaining on the filter. The plating is effected by means of a galvanic pair of plates, consisting of zinc and a coke cylinder, which are separated from each other by means of an earthen diaphram. The pair are placed in a glass vessel containing dilute sulphuric acid, and dilute nitric acid is conveyed into an earthen diaphram Experience has shown that the best mixture for the coke cylinder should consist of 5 parts by weight of finely pulverized coke, 6 parts pulverized coal, and 2 parts of common rye flour. When the cylinders are dry they are placed in earthen crucibles, in the lids of which there is an aperture for the escape of the gasses, and are then heated to redness. Those cast iron objects may be most easily silvered which have not been painted, as the removal of the paint from the surface is somewhat difficult. The cleansed object is immersed in the silver solution, and connected with the zinc pole by means of a conducting wire, and a platinum plate immersed in the liquid at some distance from the object to be silvered, and connected with the coke cylinder. A plate of cast iron, of 5 square inches surface is generally completely plated in 30 minutes.

The Russ Pavement.

Roman roads, Macadamised roads, Railroads and Plank roads have become "famous in story," but there is another kind of road destined to be as famous as any of them, namely, the Russ Pavement, the invention of Horace P. Russ, of this city. Cobble stone pavements, block pavements and rosin pavements, have been weighed in the balance and found wanting, but the Russ pavement is just beginning to shine, and shine it must as there is "scarce any wear o't." This kind of pavement is now being laid down in front of our office, and we have a good opportunity to judge of its merits. We have no hesitation in saying that if all the streets in New York were paved with it, our city would possess more splendid paved streets than any city ever possessed, either ancient or modern.

The Russ pavement is made by first laying a foundation of dry concrete well beetled down, then a second substrata of wet concrete made with small split stones and plaster.—This substrata is laid down in pannels to give access to pipes and conduits below. The frames of these pannels have an edge thinned upwards to allow the concrete to be lifted out if required to get at water pipes and gas pipes below for repairing. Upon the top of this concrete is laid a strata of heavy granite blocks nearly square. These blocks are laid down across the causeway at right angles with the sidewalks and are beetled down solidly upon the concrete strata, a little sand being used for levelling. These blocks are about 15 inches long, 9 inches in breadth and 12 to 15 inches in depth, so that of themselves they would make a good pavement just embedded in sand, but being laid down upon the concrete strata and the pavement rounded but very slightly for draining off water, it makes a most substantial and perfect causeway. The blocks being laid down so that the abraiding action of carriage wheels will traverse the blocks in curves differing from the planes of clevage, is a good and scientific plan to make more permanent the most durable system of street paving ever introduced into our city. Mr. Russ secured a patent for his substrata on the 14th of last month.

For the Scientific American.

Economy of Power in Cotton Factories.

The rapid increase of manufacturing establishments in our country during the last ten years, has so enhanced the value of water privileges, that a good mill site cannot be purchased so as to make *water* much cheaper as a motive power than *steam*.

This circumstance has led scientific men to investigate the best mode of applying water to wheels to obtain from a given quantity its maximum effect. And no doubt many curious facts, and much useful information has been brought to light upon the subject, yet after all that has been said and done, we are of opinion that, in the proper manner of communicating power from the first mover to the several machines, the manufacturer has a study more worthy his attention in point of economy than is presented in determining what kind of water wheel shall be adopted. No practical man can visit our older manufacturing establishments without noticing the clumsy arrangement of their main shafting, the ponderous apparatus by which it is set in motion and the exceedingly small number of spindles and looms they can operate, compared with the capacity of their water wheel.

There are several particulars, which if duly considered by the manufacturer before erecting his mill, would not only give it a much neater and more compact appearance, at a less expense, but also an advantage in the saving of power, of more than twenty per cent over one where they have been neglected. A few of these we shall briefly notice, hoping some of your correspondents, whose age and experience enable them to do so, will take up the subject and treat it with greater ability.

The walls of a cotton mill ought to be constructed of brick or stone, and in no case of wood. The latter will always shrink and swell with changes of the weather, thereby throwing the main shafting "out of line," and causing an almost incalculable amount of friction in the bearings. This by the way is the occasion of so many wooden mills taking fire, and not, as some may suppose, the combustible nature of the materials.

A warm sun after a rain storm striking one part of the building while the other is shaded, the former will shrink first, and the shafting running the whole length must "bind" somewhere ; if in a place not exposed to view the lubricating substance is dried up, and heat enough may be generated before it is discovered to set the mill in a blaze.

Whether built of brick or stone, a solid foundation is the first requisite, and should never be compromised. If the site does not naturally furnish this, no expense ought to be spared in creating an artificial one. Having finished the building, the heating apparatus should be completed, so as to keep the several apartments at the highest temperature during, at *least*, six weeks before the shafting is fitted up. The machinery should also be placed on the floors in the mean time. This will give opportunity for the timbers to shrink and the floors and walls to settle, (a circumstance which always takes place to a greater or less extent, according to the nature and quality of the materials used,) without interfering with the machinery and shafting, as these are to be levelled in their places afterwards.

The *means* used for conveying power from the first mover to the line of shafting, if not in accordance with correct principles will very materially diminish its effective power.—The superiority of belting over shafts and gears for this purpose is now generally conceded. Indeed while nearly all the recently erected mills have adopted the former method, many of the older ones have substituted it for the latter.

The principal advantage of belting, results from the greater *speed* at which the line shafting can be driven with much less weight on the bearings than when shafts are used—for example, if 60 horse power is to be conveyed from the first mover to the third story of a building, say 36 feet, by cast iron shafting performing 100 revolutions per minute, something over four tons of metal would have to be employed, while six hundred pounds of belting would answer the same purpose.—This of course saves extra weight on the first mover equal to the friction caused by 3½ tons. It is ascertained by experience that a belt 15 inches wide, moving at the rate of 3000 feet per minute, will convey 50 horse power. If however the belt should be 17 inches wide, it could be run much slacker, and make no more friction on the bearings than if 15 inches.—The error of making the belts too narrow has been made in every mill with which I am acquainted. As a general remark, machine makers should make all pullies for belts about one third wider than has been done hitherto. This would not only economise leather, but friction to an amount which would not be credited without actual demonstration. The smooth side of leather should be turned towards the pullies or drums, which should also be covered with leather.

W. Montgomery.

(*To be continued.*)

Model of the Steamship United States.

This steamship built for Mr. Marshall of this city, and intended to ply between this port and Liverpool, has some peculiarity in her model which from her successful trial trip has led many to believe that she will beat any thing afloat. She certainly gives fair promise but "let not him that putteth on his armor boast," is an old and a very prudent rule of guidance. We will content ourselves to abide the results of a fair voyage. New York beats the world for ships and for marine steamers she will not be behind.

Another of Hoe's Presses.

The Boston Times has been compelled by its large circulation to procure "Hoe's fast press." There are only five of these presses yet in use, but they will soon engross all others. The first and second of them were used to print the Philadelphia Ledger, the third and fourth were made for the New York Sun. The fifth is that now in possession of the Boston Times. The sixth and seventh are being made and nearly completed, to be put up in the office of the New York Herald, and the eighth and ninth are ordered for Paris.

A Rich Man Gone.

John Jacob Astor, but a few days since the richest man in America is now rich no more in this world's goods. He is laid with the clods of the valley. He died on Wednesday, of last week. Concentrated wealth is dangerous in a Republic, but by our *no-law* of primogeniture inheritance, Mr. Astor's great wealth will soon spread in a thousand channels. Standing beside the grave of the rich, how forcibly cometh to our hearts, the thrilling warning, "lay not up for yourself treasures upon earth, but treasures in heaven."

Mission of Education.

The British Government have resolved upon sending out properly qualified schoolmasters and schoolmistresses to the colonies in different parts of the world, to conduct the public schools established there for the instruction of the natives.

Scientific American—Bound Volumes.

The second volume of the Scientific American, bound in a superb manner, containing 416 pages choice reading matter, a list of all the patents granted at the United States Patent Office during the year, and illustrated with over 300 beautiful descriptive engravings of new and improved machines, for sale at this office—Price $2,75. The volume may also be had in sheets, in suitable form for mailing—at $2.

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For the Scientific American.

Rumsey the first Steamboat Builder.

Mr. Editor :—The history of Fitch and his steamboat in No. 17, reminded me of a conversation I had lately with an old gentleman of the name of Dunham, who has been spending the winter in our place. He said he had seen the first steamboat ever built (as he supposed) and that it was built at Shepardstown, Virginia, by Charles Rumsey. During the time Rumsey was building his boat, Dunham was attending school one or two hundred yards from the river and had an opportunity of seeing it every day. This boat resembled a canal boat, and the only part of the machinery visible on the outside was the top of the boiler, which rose above the deck, and some pipes from the top of the boiler which bent down into the inside. The boiler was made of two hollow half globes with a wide flange on each by which they were bolted together, and holding a barrel or more apiece. One half of the boiler was afterwards used at Shepherd's mill to cook hog feed in, and was still there some ten years ago. Dunham did not see the inside works and could not say any thing about them. The boiler and other castings were made at a furnace just below Harper's Ferry.

He told me the names of the persons who worked the boat, but I do not remember them. He remembers distinctly the time the boat was first started. There were something near five thousand persons collected on the banks of the river to see Rumsey's folly, as it was called. When all was ready to start Rumsey invited all who wished, to get on board, but there were but five who did so, Colonel Morrow, then a member of Congress, Colonel Drake and son, Henry Bedinger, and one other whose name he does not remember. The boat first started down stream but soon turned and went up four or five miles and back at a rate that the people walked up and down stream and kept alongside. A short time after this the river rose suddenly, and the boat breaking from its fastenings, was carried down stream a short distance and dashed to pieces, where parts of it remained for several years. Shortly after this trial Col. Morrow took Rumsey to Congress with him and endeavored to have an appropriation made for him, but did not succeed. Mr. Dunham thinks this boat was built as early as 1784, but is not certain.

Mr. Rumsey was a tall, spare, dark complectioned man, and very sedate.

Yours respectfully, L. G. M.

Bellefontaine, Logan Co., Ohio.

More about Gutta Percha.

The tree from which Gutta Percha is procured, belongs to the natural order *sapotaceæ* found in abundance in the Island of Singapore, and in some dense forests at the extremity of the Malayan Peninsula. It attains a considerable size, even as large as six feet in diameter; is plentiful in Sarawak, and most probably all over the Island of Borneo. The timber is too loose and open for building purposes: but the tree bears a fruit which yields a concrete oil, used for food.

Gutta Percha is contained in the sap and milky juice which quickly coagulates on exposure to the air, from 20 to 30 pounds being about the average produce of one tree. For collecting the sap, the trees used to be felled, barked, and left dry and useless.

This way of getting the sap would soon, from the great demand of the article, have destroyed entirely the source from whence it is procured, but from late accounts the trees are forbid to be felled, and the sap is only taken from them like as from the caoutche tree.

The gutta is received in scraps, or in rolls of thin layers. It is first freed from impurities by deviling or kneading in hot water, when it is left soft and plastic, and of a whitish gray color.

When thus prepared, the Gutta has many curious properties. Below the temperature of 50 degrees, it is as hard as wood, but it will receive an indentation from the finger nail. When softened in hot water, it may easily be cut and moulded; and it will harden, as it cools, to its former rigidity; and it may be softened and hardened any number of times without injury to the material. Unlike caoutchouc it has no elasticity; but it has such tenacity, that a slip one eighth of an inch thickness, sustained 42 lbs. weight, and only broke with a pressure of 56 lbs. When drawn out, it remains without contracting.

Coal Field on James River Virginia.

This coal field, which is about twenty miles long from north to south, and from 4 to 12 miles in breadth from east to west, is situated 12 miles west of Richmond, in Virginia, in the midst of a granitic region. The rocks consisting of quartzose grits, sandstones and shales, precisely agree in character with the ordinary coal-measures of Europe. Several rich seams of bituminous coal (the principal one being occasionally from 30 to 40 ft. thick,) occur in the lower division of the strata, which are arranged in a trough, and are much disturbed and dislocated on the margin of the basin, where they have a steep dip, while they are horizontal towards the centre. The fossil plants which have been determined by Mr. C. Bunberry, differ specifically, and most of them generically, from those found fossil in the older or paleozoic coal formations of Europe and North America, and resemble the plants of the oolite, of Whitby, in Yorkshire: some few, however, being allied, to fossils of the European trias. From the upright position of the Calamite and Equiseta, it has been inferred that the vegetables which produced the coal, grew on the spots where the coal is now found, and that the strata were formed during the continued subsidence and repeated submergence of this part of Virginia. The shells consist of countless individuals, of a species of Possidonomya, much resembling *P. minuta*, of the English trias. The fossil fish are nomocercal, and differ from those previously found in the new red sandstone (trias) of the United States. Two of them belong to a new genus, and one to Tetragonolepis, and they are considered by Prof. Agassiz, and Sir P. Egerton, to indicate the liassic period. The analysis of the coal made by Dr. Percy, and Mr. Henry, shows that it contains the same elements —carbon, oxygen, hydrogen, and nitrogen, in the same proportions as the older bituminous coal, of Europe and North America. Alternating layers of crystalline coal, and others like charcoal, are observed in many places, and in the charcoal Dr. Booker has detected vegetable structure, not of Ferns or Zamites, or any Conifer, but perhaps of Calamites. The coal yields abundance of gas used for lighting the streets of New York and Philadelphia, and some fatal explosions have taken place in the mines, some of which are 900 feet deep. Volcanic rocks, dikes, and beds of intrusive green stone, intersect the coal measures, in several places, hardening the shales, and hardening the associated coal, the latter being in some places turned into a coke used largely for furnaces.

An Alabama Coal Field.

Near Mr. Camp's bloomery a few miles below Scottsville, the junction of the coal may be seen, the latter being almost vertical while the coal measures are inclined at an angle of 20 degrees. Near this place fragments of coal are imbedded in the sandstone.

My examination of the Cahawba coal field extended as high up as Lacy's ferry, about thirty miles above Centreville. In this distance its greatest breadth is directly west of Montevallo and is about twelve miles. From the little Cahawba which is its southern boundary, to Lacy's ferry, is 20 miles An undulating line drawn from Shultz's creek near Scottsville, and following the ridge east of the limestone to Roup's creek, will mark its western boundary. On the east it extends to within one or two miles of Montevello, from which point it gradually contracts till it reaches within three miles of the ferry.

The coal of the Cahawba differs in many respects from that of the Warrior. It is more lamellar in its structure, seldom breaking up into fragments of regular form like the latter. The beds are generally more highly inclined, being often vertical, and they are also much thicker than any I have yet seen on the Warrior. On the right bank of the Cahawba, I have determined the super-position of at least four beds, varying in thickness between ten and four feet, and within one or two miles of the river. These beds are low in the series—some of them below the millstone grit, which leads me to think we have not yet reached the corresponding thick beds on the Warrior.

Between the coal and iron ore I had the pleasure to find an excellent fire-stone that must one day be of great value. You have, then, limestone, iron ore, fire-proof stone, coal and water power side by side and within the limits of a few miles.—*Professor Tuoney.*

Customs and Things.

In the twelfth and thirteenth centuries, good manners required that persons of different sexes, when invited to parties, should sit down in couples, and each couple should have one plate between them. In families, one goblet was deemed sufficient for all; and St. Bertrand was disinherited by his father, who was afflicted with the leprosy, for having wiped the edge of the goblet before he drank.

Beds, now such indispensable pieces of furniture, were to the Greeks and Romans articles of great luxury. When they exchanged the leaves, and skins of beasts, on which their heroic ancestors reposed, for matresses, and feather birds, the bedsteads were sometimes ivory, sometimes of cedar, and sometimes of silver. It would be difficult, now-a-days, in the middle ranks of life, to find beds such as our ancestors slept on, not only with their wives and their children, but with their dogs and their friends. An invitation to such a couch was then considered the strongest proof of affection and confidence that could be given.

The first mirrors were made of metal. Cicero carries the origin of them up to Esculapius. Moses, too, makes mention of them. It was in the time of Pompey that the first mirror was made of silver at Rome. Pliny mentions a brilliant stone, probably talc, thin slices of which being fixed upon a bright metal reflected objects with great perfection. The first mirror of glass appeared in Europe in the latter end of the Crusades.

Active Pursuits the best Cure of Grief.

Grief, of whatever measure it may exist, will always be most obstinate and dangerous in those unengaged in active pursuits, and who have consequently leisure to brood over their troubles. Bodily and mental activity, and more especially, when the result of necessity must, by creating fresh trains of association, and diverting the thoughts into new channels, tend to weaken the poignancy of affliction. Nothing in truth, serves more effectively to lighten the calamities of life, than steady and interesting employment. It is, as we conceive for the reason that females are generally exempt from the cares and excitements of business, and confined at home to their own relatively tranquil domestic duties, that they so much oftener pine and sicken under wounded affections than our own more active and busy sex. Dr. Good observes that "suicide is frequent in the distress of sieges, in the first alarm of civil commotions, or where they have subsided into a state of calmness, and the mischiefs they induced are well pondered; but it seldom takes place in the activity of a campaign, whatever may be the fatigue, the privations, or the sufferings endured. On the fall of the Roman empire, and throughout the revolution of France, self-destruction was so common at home, as at last to excite but little attention. It does not appear, however, to have stained the retreat of the ten thousand under Xenophon, and according to M. Falret, was rare in the French army during its flight from Moscow."

Geological.

Mr. W. B Findlay, a farmer near Columbus, Illinois, in digging a well on his premises, at the distance of sixty-two feet below the surface came upon two pieces or portions of a log, of what was once no doubt a large tree. The bark upon it resembled that of the pine of the northern latitudes. The ground on which the well was sunk, is a high rolling prairie, and it would appear that the whole country was once covered with water, for before coming upon the piece of timber, about 55 feet below the surface, the diggers came upon what appeared to be a new soil, composed of dead leaves and decayed vegetable matter.

The Clasp Coupling Joint.

This invention of Messrs. West & Thompson, is creating no small excitement among our most eminent engineers and scientific men. The British Attorney General has signed his name to an English Patent, and we shall soon be able to herald one from our own Patent Office. This would have been done already had Congress granted at an earlier date the necessary increase of force in the Patent Office. This joint has just been experimented with at the navy yard at Washington, and the following testimonials and opinions regarding the qualities, is something of which the inventors may well feel proud. Coming as they do from men who are so justly able to form correct opinions, and who are above uttering anything but unbiassed opinions.

U. S. Navy Yard, Washington.
March 28, 1848.

This is to certify that by order of the Hon. Secretary of the Navy I have applied one of West & Thompsons newly invented "Clasp Coupling Joint" on the steam pipe of one of the steam engines of the yard, for the purpose of testing its merits. It gives me pleasure to state that its application has been entirely successful, and also, that it is in my opinion, far superior to any method of connecting pipes that I am acquainted with. Its great superiority consists in the facility of its application and the entire certainty of its efficacy, as well as in the economy of its manufacture, the saving of material in its construction, and of time in its application in any situation where it may be used, compared with any of the old methods.

I would further state that I subjected one of these joints (2 1-2 inches diameter) connecting two pieces of English cap welded tube to hydrostatic pressure for the purpose of ascertaining its strength and efficiency, and do also certify that the joint so connected stood a pressure without leaking or giving way, of 2,566 lbs. to the square inch.

Wm. M. Ellis, Chief Eng'r. & Machinist.

I agree with the above statement.

C. S. McCauly, Commandant.

Having witnessed the trial of the above named joint when subjected to the pressure named above, I certify to its correctness.

Wm. Sewel, Jr., Chief Eng'r. U. S. N.

Sound Visible.

In this age of wonders, what will the world think when we assure it that a method has been discovered and matured by which sound will be made visible to the human eye, its various forms and ways demonstrated to sight and the power to discriminate between the tones of one musical instrument and another be as complete as to observe the action of water when disturbed by any material cause? The experiments, we believe, are likely to be, ere long, repeated in the Royal Society. The exhibition of effects on fine sand has probably led to this astonishing issue.—*Literary Gaz.*

[Wonders will indeed, never cease, and truths can never be forgotten, and verily the fact of sound becoming visible reminds us of "sounding brass and a tinkling cymbal."

TO CORRESPONDENTS.

"M. C. of Lebannon."—We have not been able to get what you desired, or we should have been happy to do so. We may be able at some other time, but then it may be too late for your purpose.

"S. K. of Mass."—For the relative strength of pillars see Tredgold and Hodgkisson's work, and make out the calculations for yourself.—The experiments of Hodgkisson are valuable.

"S. W. of N. Y."—The tinned lead pipe can be had for the same as the other kind.—Address Lowber & Leroy, No. 261 Water st. New York.

"R. S. W. of S. C."—The cement for Mill stones can be made of plaster of Paris, ground marble and soda, mixed together in a suitable quantity of hot water and applied hot or dried in an oven.

"A R. of N. H."—You were answered by mail on the 31st ult.

"J. M. of Mass."—There was a machine patented in England in 1816 for rolling iron pipes. What difference there may be between yours and it we cannot tell.

"E. A. D. of N. Y."—Your plan for saw-

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ing curves by patterns is both ingenious and feasible to all appearance. An operative model would, however, as in all such cases afford ground for pruning all that is extraneous.

"E. F. S. of Geo."—We have received yours, have obeyed your orders and are much obliged for your kindness. You will see an engraving of Mr. Winder's pump in No. 1 of this vol. Scientific American. We do not know the price and they cannot be had in this city.

"S. L. of N. Y."—We shall be able to inform you in four weeks, not before.

"R. J. of Ohio."—Your plan is not novel. Gutta Percha bands have already been used for the same purpose.

"C. D. of Vermont."—We will give your communication due attention.

"M. McN. of Va."—Look at the water wheel of Messrs. Teller & Dillenback in another part of this paper. We think that would suit you exactly.

"S. J. G. of Ky."—Seven dollars would get a good cut, and the cut yours. This is the best thing you can do.

Ranlett's Architect.

No. 2 Volume 2, of this splendid work is just published and like its predecessors, it is worthy of being truly called a "national work on architecture." This number contains perspective and sectional views of a splendid Italian Villa, and not only the views of the Villa, but the manner of laying out the ornamental grounds around the building, with full specifications. For sale at this office, price 50 cents.

Universal History.

No. 2 of this valuable work has just come to hand fresh from the press and fresh with interesting events of the days of yore. It treats mostly upon the times when the earth was young and those gigantic kingdoms of oriental grandeur, Babylon, and Ninevah, and Thebes existed. The price is 25 cents, and published by Graham of the Tribune Buildings.

American Railroad Journal.

We receive this Journal regularly, and the publishers would hear from us it we did not. It is filled with sound information especially relative to Railroads. It is published in Philadelphia, No. 105 Chessnut straet, price $5 per annum.

American Phrenological Journal.

This Magazine for April is very interesting as all the numbers are. There is a cut in it of F. Hunt, Editor of the Merchant's Magazine, and a phrenological description of his character, which must be interesting to all who have a taste for this Science.

The Minstrel Pilgrim.

A neat little book of poems bearing the above title, has just been published by Clark and Austin, 205 Broadway.

Patent Agency.

Applications for Patents made at this office, on the most reasonable terms. Neat drawings, specifications, and engravings of the first character, and cheaper than anywhere else. Notices of new inventions, Agency for the sale of Patent Rights, and all business of that nature, promptly attended to. Those who have patent rights to dispose of will find a good opportunity and field for their sale—such as Horse Power Machines and Waterwheels of every description. The largest circulation in the world for advertisements of inventions, &c.

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☞ This paper circulates in every State in the Union, and is seen principally by mechanics and manufacturers. Hence it may be considered the best medium of advertising, for those who import or manufacture machinery, mechanics tools, or such wares and materials as are generally used by those classes. The few advertisements in this paper are regarded with much more attention than those in closely printed dailies.

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Persons residing in the city or Brooklyn, can have the paper left at their residences regularly, by send ing their address to the office, 128 Fulton st., 2d floor.

THE undersigned respectfully announces his new mode of Propelling Steam Boats, in river, lake or ocean navigation, which he trusts, will be found worthy of the notice and consideration of shipbuilders and proprietors of steamboats, as being another step in advance, in the glorious career of steam navigation.

Having taken the proper means for securing a patent for this new mode, which he has called the Wind Mill Principle, in contradistinction to that of the paddle wheel in general use at this time, he is desirous that its merits may undergo the ordeal of philosophical investigation, mechanical skill and practical experience; confident, that in it will be found the following, amongst other advantages, namely, simplicity and cheapness of construction, economy of power, in the vanes entering the water at an angle of 90 degrees with the line of motion; and also, in acquiring a greater velocity to the vanes than can be attained by any other means with the same amount of power.

To personal enquiries, or by letter, postage paid, answers will be given and transmitted to any part of the United States, by applying to

ABR'M. TAYLOR, No. 183 Second street,
a8 3t New York.

Valuable Mill Privilege.

FOR SALE.—The valuable Mill privilege situated in Roxbury, Mass., formerly known as Walt's Mills, now belonging to the heirs of Richard White, is now offered for sale, together with about 10,000 feet of land, and buildings thereon, including a Grist Mill containing two run of stones, turning shop, dwelling house and barn. The above establishment is now doing a good business, it being a long established stand, and is well adapted for manufacturing purposes. Apply to RICHARD WHITE, on the premises or to JOHN HEATH, Linden Place, Brookline.
Roxbury, Mass., March, 24, 1848. a8 3t*

STEAM ENGINES.

THE Subscriber has in process of manufacture 150 Steam Engines from 5 to 20 horse power, which will be finished by the 1st of May. Also 50 from 25 to 100 horse power, to be finished in June and July. The subscriber has been long engaged in the manufacturing of Stationary Engines, and makes a busi of that alone. He feels assured that he can make a better article and for less money than any other establishment in the country. The engines are fitted up with heavy iron beds, planed and finished the whole length, with cast steel piston and valve rods. The shafts and connecting rods are of the best wrought iron. The piston is an entirely new article making it doubly secure against leakage and will last for years. They are fitted up with a patent cut-off, of an entire new construction, simple in its arrangement, not liable to get out of order, and can be adjusted to cut off with any length of stroke while the engine is in operation, or thrown off entirely if required. WM. BURDON,
al 4t* No. 102 Front st, Brooklyn, L. I.

WELLS' PATENT SLITTING SAWS.

Manufactured at the foot of 29th Street, N. R. New York.

THE superiority of these Saws over all other arrangements, is acknowledged on all hands, for doing good work, and also for being less liable to get out of repair. They may be be seen in operation at the above place. They have in every instance given entire satisfaction, and the demand for them, far exceeds the most sanguine expectations of the Inventor. Also, manufactured at the above place, all kinds of Sawmill machinery, Straight Saws with Carriage, Veneer, Scrowl, Slitting and Circular Saws; Shafting, Gearing and other machinery.

P. S. I have made arrangements for the manufacturing of D. Barnum's self-acting Safety apparatus for supplying steam boilers with water.
al 2t* T. J. WELLS.

To Mill Owners.

HAVILAND & TUTTLE'S Patent Centre Vent Pressure Water Wheel.—These wheels are now in successful operation in many towns in Maine, Massachusetts, and Rhode Island, and are found to surpass in power and facility of adaptation any water wheel now in use. This wheel was awarded the silver medal at the Fair of the American Institute recently held in New York and a diploma at the Mechanics' Fair in Boston.

The wheels are manufactured and for sale by the FULTON IRON FOUNDRY CO., South Boston, Mass.,—where the wheels can be seen and any information cencerning them had.

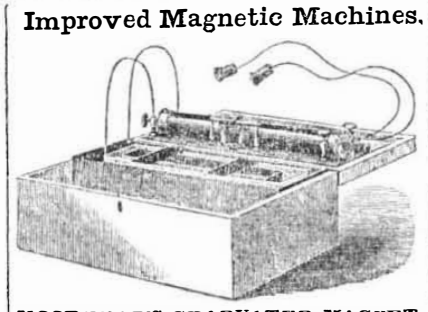
Patent Rights for different States, Counties, &c. for sale, as above. m25 6m*

"Lamp Depot."

Nos. 134 and 136 Fulton st., Sun Building.

J. O. FAY has just received from the manufactory of J. G. Moffett, a full and most splendid assortment of Solar Lamps for Parlors, warranted perfect; unequalled in style and beauty of finish—new patterns. the handsomest ever offered for sale, and the cheapest Lamp Store in New York. m25 3m*

Improved Magnetic Machines.



MOORHEAD'S GRADUATED MAGNETIC MACHINES.

IT is now universally admitted by the learned and scientific, that the mysterious power called Galvanism or Magnetism, is in fact the principle of vitality or life, and that Disease in many of its most painful forms is entirely owing to the absence of this Galvanic or Magnetic power in its healthy proportions If then we can readily supply this wondrous power, when it is thus deficient, we can successfully combat disease; and this has been fully and perfectly attained by the present beautiful and scientific instrument.

Moorhead's Graduated Magnetic Machine is an important improvement over all other forms of manufacture, and has been adopted by the Medical Profession generally, as being the most perfect, convenient and effective Magnetic machine in use. It is exceedingly simple in construction, and therefore not liable to get out of order, as is the case with all other instruments. It admits of the most perfect control, and can be graduated to any power, adapted to the most tender infant, or sufficient for the strongest adult, at the option of the operator. The Magnetic influence is imparted in a continuous manner, and with no unpleasant sensation to the most delicate patient. It requires no assistant in its use, and is in every respect entirely harmless.

Moorhead's Magnetic Machines are used with positive and permanent success in all cases of Rheumatism, acute or chronic, seated either in the head, joints or limbs; Gout, Tic Doloreux, Nervous and Sick Headache, Paralysis, Palsy, Fits, Epilepsy, Dyspepsia, Palpitation of the Heart, Spinal and Hip Complaints, Stiffness of the Joints, Lumbago, Neuralgia, Nervous Tremors, General Debility, Deficiency of Nervous and Physical Energy, and all Nervous Diseases. As a preventive for Apoplexy, the machine is confidently recommended, and in the most confirmed cases of Scrofula, Dropsy, Erisypelas, Deafness, Curvature of the Spine, and all similar complaints, its effects are equally successful.

Each Machine is compactly arranged with the Battery and all necessary appliances, put up in neat rosewood or black walnut boxes. Accompanying each is a new Manual, containing full and simple directions for its use and application in the various diseases in which it is recommended. Any person of ordinary intelligence can successfully use this machine, as everything regarding it is perfectly simple and intelligible.

Every family should possess one of these beautiful instruments. It will always be found a valuable companion, and very often the best physician in time of need.

☞ PARTICULAR NOTICE ☜

The wonderful efficacy and increasing success of the **Magnetic Machines** has induced a desire to place them within the reach of all who may need them; and the proprietor respectfully announces, that in consequence of his late improvements and increased facilities, he has been enabled to place the price for each machine, complete in every respect and warranted at

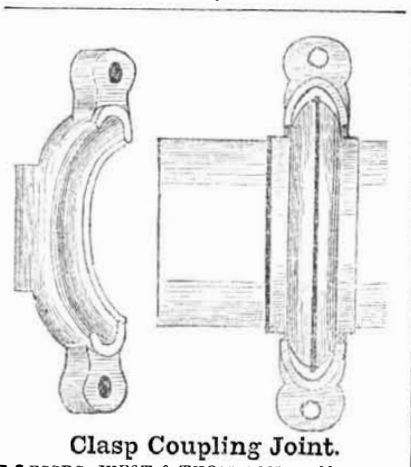
TWELVE DOLLARS.

The Graduated Magnetic Machines are manufactured and sold wholesale and retail, by

D. C. MOORHEAD, 182 Broadway, New York.

☞ **MUNN & CO.** have been appointed Agents for **Moorhead's Magnetic Machines,** and all Orders addressed to Munn & Co., accompanied with the Cash, will be promptly and carefully fulfilled.

☞ These Machines can be sent with perfect safety to any part of the country. m11 3m



Clasp Coupling Joint.

MESSRS. WEST & THOMPSON would respectfully call the attention of Engineers, Owners, or Agents of Steamboats, proprietors of Factories and others, to their new and improved method of jointing steam and other pipes together, by which means any person is enabled to connect them. For simplicity and perfection they are not equalled, and the price of their Clasp Joints will be found cheaper than the others, as they do not require any flanges, braized or soldered on the pipe, no holes to drill, or grummets to make, nor white or red lead used to make them tight; and their weight is not one half that of the old Flange Joint, They may be seen and obtained at the office of the Patentee, 29 Centre street, near the City Hall, where all orders left will be punctually attended to.

This is to certify that I have examined what is called West & Thompson's Clasp Coupling Joint, for pipes to conduct steam and other fluids, and consider it to be a new and most invaluable improvement.
m25 ROBERT L. STEVENS.

AMERICAN HARDWARE.

THE SUBSCRIBER having been engaged in selling American Hardware on commission for 7 years, solicits consignments from manufacturers, and will refer to those who have employed him the above number of years. SAMUEL C. HILLS,
f8 189 Water st.

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WE will pay 10 cents each for 100 copies, No. 16, Vol. 2, Scientific American, delivered at this office, free of expense and in good order.
f26 3t MUNN & CO

Lamps, Chandeliers,

CANDELABRA, GIRANDOLES, RICH CHINA AND BOHEMIAN GLASS VASES, HALL LANTERNS, &c.

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ARE manufacturing and have always on hand, a full assortment of articles in their line, of the following description. which they will sell at wholesale or retail at low prices, for cash:

Solar Lamps—Gilt, Bronzed and Silvered, in great variety.
Suspending Solar Lamps, gilt and bronzed.
Bracket do do do
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Solar Chandeliers, do do 2, 3 4 and 6 lights.
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do Bracket do do
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Candelabras do do do
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Hall Lanterns, a large assortment, plain and cut.
do with stained and Bohemian Glass Lights.
Lamp Wicks, Chimneys and Shades of all kinds.
Paper Shades, a large assortment of new patterns and styles.
OILS—Sperm, Whale and Lard, of the best quality
Superior Camphene and Burning Fluid.
November 29, 1847. d18 6m

Gutta Percha Bands.

THE undersigned have been appointed Agents by the American Gutta Percha Company, and are now in readiness to furnish Bands and Belting of any size or length, at the following

SCALE OF PRICES.

Inches.	Cents.	Inches.	Cents.	Inches.	Cnts.
2 :	14	5 :	38	9 :	71
2 1-2	17	5 1-2	40	9 1-2	73
2 3-4	19	6 :	45	10	80
3 :	20	6 1-2	49	10 1-2	85
3 1-2	26	7 :	57	11 :	90
3 3-4	28	7 1-2	58	11 1-2	95
4 :	29	8 :	63	12 :	100
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All Bands of extra thickness will be made by special agreement. Light Bands for Cotton Mills furnished at short notice.
Address MUNN & CO. New York. m18

Lap welded Wrought Iron Tubes

FOR TUBULAR BOILERS,

From 1 1-4 to 6 inches diameter, and any length, not exceeding 17 feet.

THESE Tubes are of the same quality and manufacture as those extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.
THOMAS PROSSER, Patentee,
d26 28 Platt street, New York

Johnson's Improved Shingle Machine.

THE Subscriber having received Letters Patent for an improvement in the Shingle Machine, is now ready to furnish them at short notice, and he would request all those who want a good machine for sawing shingles, to call on him and examine the improvements he has made, as one eighth more shingles can be sawed in the same given time than by any other machine now in use.
Augusta, Maine, Oct. 1, 1847. J. G. JOHNSON.

☞ The above is prepared to execute all orders at the shortest notice and on the most reasonable terms.

ENGRAVING ON WOOD, DESIGNING AND DRAWING.

THE Subscriber would respectfully inform the public that he is prepared to furnish Engravings on Wood, in every style of the art, upon the most reasonable terms; also designs and drawings of machinery, for specifications, at the shortest notice and with the most undeviating punctuality.

Views of Manufactories and Country Stores engraved on Wood from Daguerreotype plate with correctness.

All work executed by the subscriber warranted to give satisfaction. References can be given to some of the best mechanics in the country as regard ability, &c.
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Room No. 1, Sun Buildings. j15 3m*

GENERAL PATENT AGENCY.

REMOVED.

THE SUBSCRIBER has removed his Patent Agency from 12 Platt to 189 Water street.

The object of this Agency is to enable Inventors to realize something for their inventions, either by the sale of Patent Goods or Patent Rights.

Charges moderate, and no charge will be made until the inventor realizes something from his invention.

Letters Patent will be secured upon moderate terms. Applications can be made to the undersigned, personally or by letter post paid.
f8 SAMUEL C. HILLS, Patent Agent.

Machinists Tools.

THE Subscriber is now manufacturing a superior article of Large Turning and Screw Cutting Lathes, Drilling Machines, &c. to which he would respectfully call the attention of Machinists and others requiring the above articles. Also, Machinery of every description, manufactured to order, at 42 Gold street, New York. G. B. HARTSON. j1

Steam Boilers

BENTLEY'S Patent Tubular and other Boilers of any size, shape or power, made to order, by
SAMUEL C. HILLS,
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Premium Slide Lathes.

THE subscriber is constantly building his improved Lathes of all sizes, from 7 to 30 feet long, and can execute orders at short notice.
JAMES T. PERKINS,
Hudson Machine Shop and Iron Works,
m11 tf Hudson, N. Y.

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For the Scientific American.

To make Lake.

Boil 4 ounces of cochineal and one half an ounce of pearl ashes and then add a small quantity of the salts of tin and alum and wash them well, and dry on pieces of glass ; if annatto is used with the pearlash it will be a good scarlet.

BRAZIL LAKE.

Boil three pounds of Brazil wood one hour in three gallons of salt water and then filter through clean paper while hot, also 5 ounces of alum filtered and 3 ounces pearlash filtered, stir all together hot and a sediment allowed to stand and then dried on glass or earthenware plates.

Another way is to boil 3 pounds of Brazil wood one hour with 3 ounces of salt in 3 gallons of water, and filtered hot, then to a solution of 5 ounces of alum in 3 gallons of water add the colored liquor and then 3 ounces of pearlash in 1 1-2 gallons of water filtered and added gradually to the other mixture and left to precipitate. This is for a water paint, but if half a pound of seedlac be used with the pearlash before filtering and 5 pounds instead of 3, be used of Brazil wood, it will work well with oil. Half an ounce of annatto to the pound of wood will throw it upon the scarlet shade, but it must be dissolved in pearlash, not in salt water.

CINNABAR. VERMILLION.

This is the sulphuret of mercury. Native cinnabar is sometimes found but not so pure as to make it fit always for use. Take of quicksilver 18 pounds, flower of sulphur 6 pounds, melt the sulphur in a pot and add the mercury gradually being gently warmed ; stir with an earthen rod. If this takes fire, extinguish with a wet cloth. When this mass is cold powder it so that it all may be well mixed together and then sublime it, when it is to be ground well and washed carefully.

BLEACHING OIL. GILDING.

Pour about as much linseed oil into a shallow earthern vessel as will stand one inch in depth, then pour in six inches of water and let it stand covered with a fine cloth in the sun for a few weeks until the oil gets thick, when it is poured into a phial and submitted to a good heat, after which the clear is to be poured off and strained through a flannel cloth. To prepare wood work for gilding it should first get a coat of drying oil and a little ochre and vermillion mixed, then sized and the gold laid on. This is for gold leaf.

To prepare wood for burnished gilding it must be prepared with parchment size. Take 1 pound of parchment cuttings or white leather used by glovers and boil it in 6 quarts of water till the whole is reduced to 2 quarts, or when taking out a little it will look like a jelly, when it must be strained through a flannel and it will be fit for use. Wood for burnish gilding should be first rubbed with fish skin or some better material, then it must be primed with the size mentioned above mixed with whiting by melting the size and strewing it with the whiting and stirring them well together. A number of coats must be given and each one dried before the other is put on and then when the last coat is dry, it must be moistened with water by a linen rag. Then a composition of pure white soap thickened while dissolved in water to the thickness of cream by glover's size and diluted with water must be spread with a brush over the whole of the work and suffered to dry, and another coat given. After the last coat, the part to be burnished must be rubbed with a soft cloth until it be perfectly even. Some add a little vermillion to the gilding size and some color the work first with yellow and the size, or red lead and vermillion, this is to give the appearance of gilding to the deep parts of carving where the gold cannot be laid on, but it more frequently happens that this work is colored after the gilding is performed by what is called *matting*. The work being thus prepared it is wet with a camel hair pencil and the gold laid on the wet part till it be completely covered, or become too dry to take any more gold, and so on till all the work be covered with the gold that is wanted. Some wet the work with whiskey, but water is about as good. Then the interior, or hollow parts should be matted with ochre or Dutch pink and red lead. Isinglass size will answer well for mixing the colors for matting, or the white of eggs. After the work is perfectly dry it can be burnished with an agate burnisher, or a flint one. But the work must be perfectly dry or it will be spoiled by burnishing.

JAPANNER'S GILDING.

This gilding is performed by means of gold powder, or imitations of it.

Compound gold size is made thus : Gum anima and asphaltum each one ounce, red lead, litharge of gold and umber each one ounce and a half. Reduce the grosser ingredients to a fine powder and having mixed them, put them together with a pound of linseed oil into a proper vessel and boil gently with constant stirring by a glass rod till the whole is well incorporated. Continue the boiling and stirring until on taking out a small quantity it appears like tar as it grows cold. Then strain the mixture through flannel and keep it carefully stopped up in bottle having a wide mouth for use. When it is wanted it must be ground with as much vermillion as will make it an opaque body and also as much turpentine as to make it of a proper thickness for working with the pencil. Another plan and perhaps better, is to take of linseed oil one pound and of gum anima four onnces. Set the oil to boil in a proper vessel and add the gum anima in powder gradually, stirring till the whole is well mixed. Let the whole boil and treat as in the receipt before this, with the litharge, &c. but when applied it must be mixed with vermillion and oil of turpentine as before directed. This gold size may be used on metals, wood or any other ground whatever.

True gold powder is made as follows : Take any quantity of leaf gold and grind it with virgin honey on a stone till the texture of the leaves be perfectly broken and their parts divided in the minutest degree. Then take the mixture of gold and honey from off the stone and put it into a china mortar with water and stir it well about till the honey is melted and the gold freed from it. Let the basin or mortar then stand at rest till the gold subsides, and when it is so pour off the water from it and add fresh quantities till the honey is entirely washed away, after which the gold may be put on paper and dried for use. A gold powder of a more intense yellow, brighter than this may be made by precipitating gold dissolved in aqua regia by means of copperas or sulphate of copper, which can be done by pouring the nitro muriate of gold in water and dropping a solution of copperas or muriate of tin in it, when the gold will fall to the bottom, and then the clear should be poured off and the gold washed and dried on a piece of glass. German gold, which is made from Dutch leaf, if varnished, will answer for common purposes. It is made in the same way as the first directed above.

Aurium Mosaicum, which is tin colored and rendered of a flaky, or pulverine texture, greatly resembles gold powder, and is much used in gilding. Take of tin 1 pound, of flower of sulphur 7 ounces, of sal ammoniac and quicksilver each half a pound. Melt the tin and add the quicksilver to it in that state and when the mixture has become cold powder and grind it with the sal ammonia and sulphur till the whole be thoroughly mixed.—Calcine them in a mattress, and the other ingredients subliming, the tin will be converted into the Aurium Mosaicum and will be found at the bottom of the glass like a mass of flaky gold powder, but if any dark marks appear in it they must be carefully picked out or cut out. The sal ammonia ought to be perfectly white and the quicksilver must be pure. The calcination may be best performed in a coated glass vessel hung in the naked fire and the body be of a long figure that the other ingredients may rise so as to leave the colored tin clear of them. The quicksilver although it be formed into cinnabar along with the sulphur need not be wasted. It can again be revived by distilling it with quick lime.

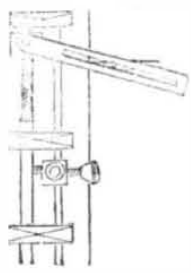
Lead may be detected in quicksilver if adulteration is suspected, by putting a small quantity in a crucible on the fire when the silver will all sublime away and leave the lead behind.

The gilding with japanner's gold may be used on any substance, and there is no other preparation necessary to its being gilt than by just having the surface clean.

The manner of using japanner's size is this. Put a small quantity prepared as above directed and mixed with a due proportion of oil of turpentine and vermillion and put them into the vessel used for colors for painting in varnish. Then either spread it over the work with a brush, where the whole surface is to be gilt, or draw with it by means of a pencil the proper figure desired and let it touch no other part. Then let it rest till it be fit for the gold, which will be known by it being a little clammy and not fluidous. When it is thus dry, the gold powders are used by a piece of wash leather wrapt round the forefinger and dipped in the powder and rubbed lightly over the sized work, or what is better, the powder may be spread by a soft camel hair pencil. The whole being covered it must be left to dry and the loose powder cleared away and collected with the soft brush. When leaf gold is used, the method of sizing must be the same as for the powders, but the point of due dryness is very nice in such a case for the leaves must be laid on while the matter is in a positively correct state, or the whole must be sized and gilt over again. When more gold is mixed with the turpentine than is wanted, it can be immersed under water until it is again wanted, which is a good plan to preserve all kinds of paint or other composition that contains oily substances.

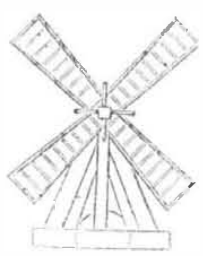
MECHANICAL MOVEMENTS.

Traversing Bar.



This is an arrangement whereby the perpendicular rod will be alternately traversed by the horizontal motion of the zig zag slot of the arm in which the pin is placed, consequently the traverse will assume nearly a perpendicular direction. The working of rods in slots used to be very common in nearly all machines, but as far as possible, it is best not to use them as the friction is very great.

The Windmill.



The Windmill is familiar to every one.—It is of most use in level countries where there are no mountain streams to propel water wheels. For this reason Holland has always been most distinguished for her windmills. At present she employs an immense number continually to pump the water out of her *voes*. Stevinus, a Dutch engineer, was the first who made carriages to travel on the roads by wind. He was a very scientific and skilful man. He lived in the 16th century.—The windmill houses are generally circular.—The shaft is attached to five frames with vanes or sails on them. The surface of the sails are not perpendicular to the axis, but inclined at an angle generally of 72 degrees at the end next to the axle, and at 83 degrees at the end farthest from it. Suppose the axle or main shaft to be placed in the direction of the wind —the wind will then strike the sails obliquely and the force will be resolved into two parts, one of which acting in the direction perpendicular to the action, gives a motion to the rotation of the sails and consequently to the wind shaft, from which it is communicated to the machine. The era of the invention of windmills is buried up in the ages of antiquity, and they are old and familiar to us. We can scarce reconcile ourselves to an old rural landscape, unless the old windmill crowns the brow of some grassy hill.

Substitute for Chloroform.

Professor Hieberg of Christiana, Sweden, has employed the sulphate of carbon as a substitute for chloroform. This gas is prepared by causing the vapor of fused sulphur to pass through charcoal powder heated to redness in an iron tube. When chloroform was first introduced in this country, we exhorted cautiousness in its use. We should not like to apply either ether, chloroform or bisulphate of carbon to a person of a short, thick neck —it would be dangerous.

Heat of the Burning Glass.

Convex lenses and concave mirrors, are frequently used for the production of high temperatures, by converging the rays of the sun, and those for this purpose are called burning glasses. At the focal point, any small object being exposed, its temperature is instantly raised. Few substances can withstand the heat—brick, slate, and other earthy matters instantly boil, metals melt, and even volatise away. Gold and silver melted in this manner throws off a vapor by which other metals may be gilded. The heat attained by the burning glass, far exceeds that of the best constructed furnace.

Echoes.

Echoes are produced by the reflexion of sounds. The distance which a person should be from a perpendicular wall or building in order to produce an echo with the voice, is about 62½ feet. If there are a number of perpendicular objects, at the suitable distance, the sound will be repeated many times. Near Milan there is a remarkable echo which repeats a sound thirty times, and at Port Kent, on Lake Champlain, there is also a most beautiful echo.

Speaking Trumpets.

The efficiency of the speaking trumpet depends on its length. It is stated that through such an instrument 18 to 24 feet long, a man's voice may be heard at the distance of three miles.

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